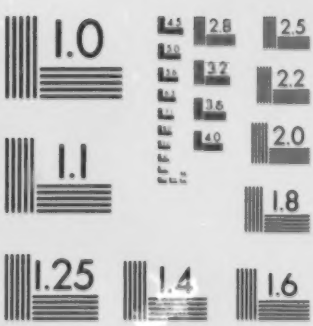

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ABSTRACT

Two workshops on the preparation of teachers for vocational and technical education in Asia and the Pacific were held in 1981 and 1982 in Bangkok, Thailand. During the two meetings, the following activities were carried out: (1) problems faced by the developing countries in preparing teachers, instructors, and teacher educators for vocational and technical education were identified; (2) feasible solutions to these problems, taking into account the growth points and gaps in respect of structures, strategies and methodologies adapted for training, retraining, and upgrading of vocational and technical teachers were explored; (3) the existing curriculum/course content for preservice and inservice/continuing programs for vocational and technical education in secondary and postsecondary schools in Asia and the Pacific was reviewed; (4) guidelines for preservice and inservice/continuing programs in preparing and upgrading vocational and technical teachers, for use in training institutions and workshops and as guides for supervisors or teacher trainers were developed; and (5) recommendations for regional cooperation in vocational education and in teacher preparation programs were made. (Summaries of reports given by delegates from 16 Asian and Pacific countries are included in the conference proceedings.) (KC)

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ED215136

VOCATIONAL AND TECHNICAL TEACHER PREPARATION IN ASIA AND THE PACIFIC

Report of two Regional Workshops

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
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F O R E W O R D

An increasing attention has been given to the linking of education and productive work in the international scene. For the purposes of vocationalization of education or the interlinking of education and productive work, I think that the most important point would be to make skills and content taught or developed in schools relevant to the social needs. Such necessary skills and content during the school education may, of course, vary according to the stages of social and economic development of the country.

It is, therefore, quite natural that there exist different approaches among the countries in establishing institutes or systems for vocational and technical education and in preparing educational personnel for such education systems. But, at present, the common goal or concern across the countries would be to make close relationship between the school and the society through vocational and technical education.

Further, one of the pertinent issues in the area of vocational and technical education would be how to interlink skills taught in schools and skills required in the society or industries. As for the content of vocational and technical education, I think it is very necessary to properly identify the needs for such education in the society and to develop suitable programmes in the school so as to meet such needs.

In view of these, the National Institute for Educational Research (NIER) of Japan organized two regional workshops on the preparation of vocational and technical education teachers; one in early 1981 and the other in early 1982. This publicatior is the combined report of these two workshops and it is hoped that this publication will provide the state of vocational and technical education in the Asian and Pacific region as well as the basic idea for developing training programmes for vocational and technical education teachers.

I would like to express my deep appreciation to all the participants of the two workshops for their outstanding contributions. In particular, I am very grateful to Mr. R. Gordon Tasker, Director, Educational Service, Department of Further Education, Adelaide, Australia for his hard work in preparing the draft report of the first workshop. Acknowledgement is also made of the co-operation extended by Mr. Maurice H.A. Pentecost, Education Officer, Continuing Education, Southern Regional Office, Department of Education, New Zealand, in finalizing this publication.

Hiroshi Kida
Director General
NIER

ACKNOWLEDGEMENT

Workshop members wish to record their deep appreciation of the contributions made by the Director General and staff of the National Institute for Educational Research (NIER) towards the success of their discussions and the production of this report.

Also workshop members wish to record their deep appreciation of the support the Institute has provided for a number of years to regional co-operation in Asia and the Pacific, and their hopes that the Institute will continue this work, and help to implement the recommendations contained in this report.

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CHAPTER I

INTRODUCTION

Vocational and technical education has been playing an important role in supplying qualified manpower for the development of countries in the Asian and Pacific region. Various innovative programmes which may serve as bases for the development of more effective programmes have been tried out in the fields of vocational and technical education. However, it is felt that there is still a need to prepare better qualified and more competent teachers, who possess greater knowledge of developments in science and technology, for vocational and technical education. It is necessary to enquire about more suitable ways and means for the preparation of such teachers.

Considering the importance given to the preparation of teachers for vocational and technical education and various on-going programmes undertaken by the countries participating in the Asian Programme of Educational Innovation for Development (APEID), the National Institute for Educational Research (NIER) in collaboration with the Asian Centre of Educational Innovation for Development (ACEID), Unesco Regional Office in Bangkok, organized a regional workshop on the preparation of teachers for vocational and technical education from 6 to 28 March 1981 (first workshop) and as a follow-up, a second regional orkshop from 28 January to 19 February 1982, for the purpose of improving and strengthening the system of preparing and training teachers in the region.

Objectives

The objectives of the two workshops as adopted by the participants were as follows:

First Workshop

1) To identify the actual problems presently faced by the countries in preparing teachers, instructors, and teacher educators for vocational and technical education;

2) To explore feasible solutions of the problems related to the preparation of teachers, teacher educators and other educational personnel for various fields of vocational and technical education taking into account the growth points and gaps in respect of structures, strategies and methodologies adapted for training, retraining and upgrading of vocational and technical teachers; and

3) To make recommendations for co-operative action programmes for vocational and technical education among the countries in the region.

Second Workshop

1) To review the existing curriculum/course content for pre-service and in-service/continuing programmes for vocational and technical education teachers in secondary schools and post-secondary schools/institutions in the region of Asia and the Pacific;

2) To develop guidelines for pre-service and in-service/continuing programmes in preparing and upgrading vocational and technical teschers, for use in training institutions and workshops and as guides for supervisors or teacher-trainers; and

3) To explore ways and means for regional co-operation in preparing teachers for vocational and technical education.

Participation

First Workshop

Twenty (20) participants from the following countries attended the workshop: Australia, Bangladesh, India, Indonesia, Japan, Republic of Korea, Malaysia, Nepal, New Zealand, Pakistan, Philippines, Singapore, Sri Lanka, Thailand and Viet Nam.

Second Workshop

The second workshop was attended by nineteen (19)

participants and one resource persons from fourteen countries in the region, namely; Australia, Bangladesh, India, Japan, Republic of Korea, Malaysia, Maldives, Nepal, New Zealand, Pakistan, Philippines, Singapore, Thailand and Viet Nam.

(A list of Participants is given in Annex I)

Officers of the Workshop

The following participants served as officers of the respective Workshops:

First Workshop

Chairperson: Mr. Ooi Teik Beng (Singapore)

Vice-Chairperson: Mr. Swath Tscheikuna (Thailand)

Rapporteurs: Mr. R. Gordon Tasker (Australia)

Mr. Alberto Poblete (Philippines)

Second Workshop

Chairperson: Prof. T. Subbarao (India)

Vice-Chairpersons: Mr. G. Woodburne (Australia)

Mr. Ooi Teik Beng (Singapore)

Rapporteurs: Mr. M.H.A. Pentecost (New Zealand)

Mrs. C.U. Bonaga (Philippines)

The Report

At the end of the first workshop a draft report was prepared and circulated in limited number. The findings described in the report were elaborated and modified at the second workshop. This final report was prepared as a combined report of the two workshops held in 1981 and 1982 at NIER.

CHAPTER II

TRENDS AND ISSUES

A. Introduction

Participants of the two workshops prepared detailed country reports on the preparation of teachers for vocational and technical education, and the country-wise summary reports are given in Annex II. This chapter presents an overall review of the present status as well as trends and issues in the participating countries. The findings of this analysis apply to most countries of the region participating in the workshops, but do not necessarily reflect the position of trends and issues of the entire region of Asia and the Pacific.

1. The usual meanings of the terms vocational and technical education among the member countries are as follows:

- *Vocational Education* is defined as those educational programmes aimed at the occupational level of craftsman or basic trade. This represents the level of the skilled worker.

- *Technical Education* is defined as those educational programmes aimed at the occupational level of technician or the sub-professional level which is generally considered as one step above the craftsman level but is below the professional level.

- The workshop acknowledges other areas of vocational and technical education, for example: (a) general work-orientation courses particularly in secondary schools; and (b) higher professional programmes, usually provided in polytechnics and universities.

- The definitions used are applicable to all occupational areas including commerce, agriculture, the service industries and the traditional technical areas.

2. What each country or community does about vocational and technical education depends upon such factors as its

stage of industrial and economic development, history and tradition, attitudes and values, social structures and physical geographic conditions, as well as its educational structure. That each country is increasingly becoming part of an international community also affects the provision of vocational and technical education.

3. In many countries, vocational and technical education has lower status than academic education. This lower status is often perceived by potential students and the community and thus affects their attitudes to vocational and technical education. All participating countries, however, have examples where this trend is changing with the provision of new and better facilities, new curricula and better trained teachers.

B. Vocational Education

1. Vocational education is provided in all countries

   - in secondary schools; or
   - in post-secondary schools, non-formal centres, institutes, or colleges; or
   - in industry;

   and in a combination of the above three.

2. Vocational education courses are offered:

   - full-time, particularly at schools; or
   - part-time, associated with employment, including day or block release, and
   - in distance learning programmes

   Some countries associate vocational education with an apprenticeship system.

3. In addition to a theoretical base, the curriculum for vocational education is usually characterised by an emphasis upon the achievement of manipulative skills involving equipment, material and processes. Workshop or

laboratory practice is usually seen as essential and many such programmes are augmented by on-the-job experience. There may also be courses in social education. Curriculum development sometimes involves the use of expertise from commerce, industry, agriculture, fisheries, and other areas. Graduation may lead to a certificate.

4. The majority of countries are attempting to solve the problems of:

- an insufficient student intake particularly of those with higher ability;
- the lack of relationship between course provisions and manpower needs;
- inadequate and frequently outmoded facilities; and
- high drop-out rates and failures.

C. Technical Education

1. Programmes are usually provided in post-secondary institutions (e.g. colleges, institutes, centres) under the control of a ministry of education.

2. Technical education programmes usually are of at least two years' equivalent full-time duration after the successful completion of compulsory secondary schooling. The trend is towards an entry requirement of the successful completion of a full secondary education. Some programmes have, as a prerequisite, previous completion of certain school subjects, e.g. mathematics and science.

3. Graduation from a technical education course leads to an award of a certificate or in some cases, a diploma. (There is no consistent usage of the terms, certificate and diploma).

4. The curriculum for technical education courses usually:

- is specialised for a particular occupation, in theory and practice;

- involves knowledge and use of equipment and materials; and

- includes workshop/laboratory experiences

Practice is sometimes augmented by work experience. There is an emerging trend to include some more general studies e.g. communications, social, professional and environmental studies, and other general enrichment studies.

D. Vocational and Technical Teacher Training

1. Just as vocational and technical education varies from country to country according to many local factors, so does the preparation of the teachers for these forms of education. Too little attention has been paid to the preparation of vocational and technical teachers.

2. The current state of vocational and technical teacher training is characterised by:

- an insufficient number of skilled and knowledgeable people being attracted to becoming teachers of vocational and technical education;

- a high turn-over rate caused by the loss of teachers to industry and commerce;

- the high number of existing teachers who have no adequate preparation as teachers; and

- the relatively few teacher training institutions which have specific programmes for vocational and technical teacher preparation, and which have specialized staff, facilities and resources to provide the required programmes.

3. The sources of trainee teachers for vocational and technical education are:

- secondary school graduates;

- post-secondary institution graduates; and

- personnel from industry and commerce.

The majority of countries receive their students from secondary schools and post-secondary institutions. These same countries agree that there are advantages in the recruitment of potential teachers from industry and commerce, but find this source difficult to tap. This is due largely to tradition, and because, currently, the salaries of teachers cannot compete with those in industry and commerce.

4. At entry the trainee teacher's educational qualifications can range from a secondary school qualification only to that qualification with the addition of post-secondary qualifications at the level of skilled worker, technician, or professional.

The institutions which offer these courses, whether pre-service or in-service, include universities, teacher training colleges, and special training centers. Most courses are pre-service.

The awards given at the end of the programmes range from degrees through to diplomas, and certificates. In some cases the awards are granted by a ministry of education or labour rather than an institution.

Just as there is variety in the awards given for completion of teacher training courses there is also variety in the accreditation of the institutions involved in the delivery of these courses. For example, in some countries accreditation is given by professional associations and organisations while in others it is granted by government ministries or national education accrediting bodies.

Despite these variations all countries agree that accreditation is an important means of maintaining quality and standards in teacher training education programmes. The trend is increasingly towards accreditation.

5. Curriculum development and planning for vocational and technical teacher preparation programmes in many countries involves only the staff of the teacher training institutions that offer the programmes. However, in some countries there is a trend to involve a wider range of parties.

Despite differences in the process of developing programmes, most of them contain the following elements:

- the teacher's subject specialization;

- pedagogical studies; and

- general and liberal studies.

In addition to such pre-service training there are a variety of in-service programmes offered either full-time or part-time which focus on the same areas allowing for the different educational qualifications and work experience of the trainees.

6. In some countries that have programmes for preparing vocational teachers for the school system there is no programme for preparing teachers for post-secondary vocational or technical institutions.

7. The growing demand for graduates in technical and service occupations and for other skilled workers has led in most countries to a greater emphasis upon manpower planning and development. In this context there has been a significant increase in the range of programmes in vocational and technical education and in training programmes in industry and commerce.

The natural consequence of this has been an increased demand for vocational and technical teachers and industrial trainers. This has underlined the need for increasing the numbers of institutions involved in the preparation of such personnel and the need for better programmes of preparation.

E. Staffing of Vocational and Technical Teacher Training Courses

1. Many of the countries represented at the workshop experience difficulties in staffing centres for training vocational and technical teachers. Difficulties include:

- having to appoint trainers who lack the necessary relevant industrial experience, vocational and technical teaching experience and/or pedagogical training; and

- maintaining effective on-going in-service training programmes to upgrade the experiences and qualifications of trainers.

Ways and means of minimising these difficulties have been adopted in various countries. Among these measures are:

- recruiting trainers from overseas;

- sponsoring trainers to overseas training programmes;

- employing suitable part-time tutors from industry, or the vocational and technical education system;

- asking trainers to return to vocational and technical teaching;

- arranging in-service workshops in the training institutes; and

- organising team teaching with a key resource trainer.

2. The preparation of the teacher trainers and their continuing education is a concern for most of the member countries. Trainers are being recruited from a variety of sources often with inadequate training and usually lacking in experience, in some way. The trend is for the deficiencies in the trainers' backgrounds to be minimised by the provision of continuing education. In some countries there are moves toward the establishment of formal training programmes in the form of university courses, and the introduction of more carefully planned continuing education.

3. There has been a trend toward the development of regional and international cooperation in vocational and technical education including some ventures for the trainers of vocational and technical education teachers. Examples are the two NIER workshops which have produced this report, the Colombo Plan Staff College for Technical Education, the linking of individual institutions, and the work of Unesco in the region. These programmes are viewed as

beneficial providing that:

- the objectives of the particular programme are spelled out in detail;
- the programme is planned in detail;
- the selection of personnel is rigorous;
- the staff selecting the personnel represent all parties;
- the programme is constantly evaluated;
- the programme is reviewed according to the evaluation findings; and
- the programme results are reported in detail to participating parties.

CHAPTER III

GUIDELINES FOR VOCATIONAL AND TECHNICAL TEACHER PREPARATION

A. Guiding Principles

1. Any attempt to create a model curriculum for the preparation of vocational and technical teachers for all the member countries would be inappropriate; moreover it would contradict what we see as one of the basic elements in curriculum construction - the involvement of all affected parties in the process. What follows in this chapter is a series of guidelines or guiding principles that, we consider, should be useful in such curriculum construction.

2. In aiming at these guidelines and guiding principles, the following elements were taken into account:

2.1 The levels of staff to be trained:

- practical arts teachers (pre-secondary and secondary)
- vocational teachers (secondary and post-secondary)
- technical teachers
- training officers and
- educational administrators

2.2 The entering competencies and characteristics of trainees:

- age
- educational qualifications
- industrial experience

2.3 Patterns of programme delivery:

- pre-service
- in-service

- continuing

2.4 The parties to be involved in curriculum development:

- trainee teachers
- practising teachers
- representatives of teachers' unions
- educational administrators
- curriculum specialists
- lay people
- representatives of industry
- representatives of professional associations
- teacher educators

2.5 The broad competencies to be developed:

- planning and organising
- preparing
- implementing
- evaluating
- guiding and counseling
- managing
- growing professionally

2.6 Curriculum components:

- pedagogical studies
- industrial experience
- subject specialization
- general and liberal studies
- educational research
- educational management

B. Programme Components - Level and Emphases

1. The matrix that follows is an attempt to represent in a graphic form the components that the workshop sees as being significant in the curricula to be developed for the various groups to be trained.

2. The emphasis to be given to each component for each level of trainee is represented by one of the letters - A.B.C. The letter A means that the component should be taught either at an advanced level or given great emphasis, while the letters B and C indicate decreasing levels or decreasing emphasis.

3. The groups of trainees are represented in the matrix in the following ways:

PAT: *Practical Arts Teachers*

VT: *Vocational Teachers*

TT: *Technical Teachers*

TA: *Training Officers (in industry)*

EA: *Educational Administrators*

4. Practical arts teachers, training officers and educational administrators are included in the matrix in an attempt to provide a clearer view of the relationships among those groups whose primary concern is preparing people for the world of work:

Area/Components	Programme Levels				
	PAT	VT	TT	TO	EA
1. Pedagogical Studies					
1.1 Historical, phisophical and sociological foundation of vocational and technical education	C	B	B	-	A
1.2 Instructional design and methodologies	B	A	A	A	A
1.3 Principles of human development	C	B	B	B	A
1.4 Principles of learning and teaching	A	A	A	A	A
1.5 Curriculum design and development	C	B	B	A	A
1.6 Measurement and evaluation	C	A	A	A	A
1.7 Counselling and guidance	B	B	B	B	A
1.8 Classroom/workshop/laboratory management	A	A	A	A	A
1.9 Educational technology	B	A	A	A	A
1.10 Professional ethics	A	A	A	A	A
2. Industrial Experience					
2.1 Familiarization with industry	C	A	A	A	A
2.2 Skill development	C	A	B	A	C
2.3 Role of craftsman, technician and technical personnel in industry	C	B	A	A	A

Area/Components	Programme Levels				
	PAT	VT	TT	TO	EA
2.4 Understanding industrial and management processes and practices	C	A	A	A	A
2.5 Industrial management and practice	C	B	A	A	A
2.6 Career opportunities	C	A	A	A	A
2.7 Safety and productive concepts	A	A	A	A	A
2.8 Work experience	-	A	A	A	C
3. *Subject Specialization*					
3.1 Core subjects	A	A	A	A	A
3.2 Applied subjects	A	A	A	A	A
3.3 Related subjects	A	A	A	A	A
3.4 Foundation subjects	A	A	A	A	A
4. *General and Liberal Studies*					
4.1 Languages	A	A	A	A	A
4.2 Moral and ethical studies	A	A	A	A	A
4.3 Environmental studies	C	B	B	A	A
4.4 Extra/Co-curricula (Cultural)	A	A	A	A	A
5. *Educational Research and Management*					
5.1 Educational Research					
5.1.1 Research methodologies	-	C	B	B	B

Area/Components		Programme Level				
		PAT	VT	TT	TA	EA
5.1.2	Research practices	-	C	B	B	B
5.1.3	Appreciation of research findings	C	B	B	B	A
5.1.4	Social science approach	-	C	C	B	A
5.1.5	Retrieval and dissemination of research findings	C	B	B	B	A
5.2	Educational Management					
5.2.1	Behavioral science approach	-	C	C	B	A
5.2.2	Organizational behaviour and development	-	-	-	B	A
5.2.3	Performance and evaluation	-	C	B	B	A
5.2.4	Management of change	-	C	B	B	A

C. Course Objectives and Descriptions

To assist those involved in the training of vocational and technical teachers develop the programmes along the lines indicated above, course objectives and descriptions are detailed in this section.

1. General Objectives

General objectives for the teacher education of vocational and technical teachers are:

i) To develop mastery of the theoretical and practical aspects of the student's area of specialisation;

ii) To enable the student to relate the skills of his field of instruction to actual industrial practice;

iii) To develop mastery of techniques for the planning, preparation, implementation, management and evaluation of teaching/learning strategies including appropriate applications to particular specialisations;

iv) To develop the ability to guide and counsel students;

v) To develop positive attitudes to and habits of personal and professional growth and development;

vi) To develop an understanding of basic research and managerial practices;

vii) To develop an appreciation of the historical, philosophical and sociological bases of vocation and technical education;

viii) To develop an informed appreciation of the main cultural and ethical values of the community; and

ix) To develop communication skills in the language of instruction and/or the native language.

2. Pedagogical Studies

2.1 Course objectives

Upon successful completion of pedagogical studies, trainee-teachers will be able to:

1) Comprehend the fundamental background of vocational and technical education from the historical, philosophical and sociological viewpoints;

2) Understand curriculum development and in particular the concept of curriculum as a process that flows from theory to practice;

3) Understand the basic principles and theories of learning and teaching and develop teaching strategies utilising them;

4) Identify the developmental characteristics of their students in terms of their physical, cognitive, emotional, career, personality and social growth;

5) Plan instruction and choose the most appropriate methodologies to implement it;

6) Grasp the role of measurement and evaluation in education and apply appropriately a variety of such methods and techniques;

7) Understand the key principles and methods in career counselling and guidance;

8) Demonstrate the managerial aspects of the classroom/workshop/laboratory and in particular the interpersonal dimentions of such management;

9) Indentify and evaluate emerging instructional methods, media and techniques particularly in the field of course material development and be able to apply them where appropriate; and

10) Develop guidelines for a code of professional ethics and the criteria for respecting them.

2.2 Course Descriptions

The primary objective of pedagogical studies is to give the trainee teachers a comprehensive understanding of the educational processes and to master their applications to teaching. The courses that make up pedagogical studies will therefore first concentrate on theoretical concerns such as the historical/philosophical/sociological foundations of vocational and technical education and the principles and theories of human development, learning and teaching.

They will next turn to the application of these theoretical aspects to the particular teaching situations students will encounter by developing understanding and skills in instructional design, curriculum development, measurement and evaluation and counselling and guidance.

Finally, they will promote notions of professional ethics, growth and management skills in the technical and vocational education setting.

A guiding principle of these studies is that they should be participatory in nature and practice with the aim of producing a self-motivated, creative and responsible professional who will be adaptable to the changing world of work and education.

3. Industrial Experience

Industrial training and experience are essential compenent of teacher training programmes. It is provided to enable the trainee teachers to cross-fertilize theoretical instruction with industrial practices and approaches. Industrial placements are arranged with appropriate time allocations to expose the trainees to industrial settings so that they may understand the roles and functions of technical personnel in industry, gain insights into industrial and managerial processes and practices, have experience in the industrial setting for the enrichment of industrial skills, learn safety and productivity concepts, develop appropriate work habits, and be aware of career paths that are available to their students.

4. Subject Specialisation

4.1 Course Objectives:

By the end of these courses trainee-teacher will:

i) Have developed a sound understanding of the theoretical aspects of their major areas of specialisation;

ii) Be able to apply the knowledge and skills of the major specialisation to practical situations;

iii) Have developed a sound understanding and mastery of the theoretical and practical elements of the related areas of study;

iv) Be able to apply relevant principles and processes from the fields of mathematics and science to the specialisation; and

v) Be able to communicate effectively in the language of instruction.

4.2 Course Descriptions

The technical subjects to be taught will generally have three components: firstly, the more theoretical elements; secondly, the practical applications in this field

and thirdly, supporting related areas of technical subjects both theoretical and applied. The courses should also include subjects which provide a theoretical base for the technical subjects e.g. physics, biology, and communication skills in the language of instruction.

5. General and Liberal Studies

5.1 Course Objectives

By the end of the courses trainee-teachers will have

i) Developed a sound appreciation of the main cultural and ethical values of their communities;

ii) Gained an awareness and understanding of the impact of science and technology on those communities;

iii) Developed an understanding of the causes of environmental destruction and the means of preventing or curtailing it;

iv) Gained a knowledge of the processes of technological and social change in the community at large and in the work force in particular;

v) Developed a sound knowledge of the local language(s)

vi) Developed a sound knowledge concerning appropriate extracurricular activities.

5.2 Course Descriptions

The course(s) taught to achieve these objectives may be based on traditional disciplines such as labour economics, or the history and philosophy of science or they might be developed around themes such as technological change, environmental pollution, and the traditional values, ethics and cultures of the country concerned. Attention will also be paid to the use of the local language and the broadening values of extracurricular activities.

6. Educational Research and Management

6.1 Course Objectives: Research

At the end of the course, trainee-teachers will:

i) Be familiar with research methods, techniques and practices and their application to the classroom and curriculum development;

ii) Be competent to retrieve research information and disseminate it to the appropriate parties at the appropriate time;

iii) Be able to utilise appropriate research findings in their everyday work as vocational and technical teachers; and

iv) Be aware of the need to participate in research activities in the wider educational setting.

6.2 Course Descriptions

The course will cover the different research methodologies and show their relationships to teaching practice. It will also cover the fundamentals on designing a simple research programme as in action research, and utilizing the findings as a teacher. The course will also describe the wider range of educational research methodologies to promote vocational and technical education and training. Special attention will be paid to the retrieval and dissemination of research findings and the use of such an agency as a clearing house.

6.3 Course Objectives: Management

By the end of the course, trainee-teachers will:

i) Have developed an awareness of the importance of human relationships in the management and life of their institutions;

ii) Be able to apply a variety of strategies appropriately to their part in institutional management;

iii) Have developed skills in professional self-evaluation, evaluation of an institution educationally and the management of change in the institutional environment; and

iv) Have developed skills in the effective use and management of institutional resources.

6.4 Course Descriptions

The courses taught to achieve these objectives will include an introduction to the behavioural and social sciences, general principles of educational management and administration, organizational behaviour and development, problem analysis and solution, and the management of change.

D. The Implementation of Training Programmes

1. Pre-service Programmes

The above guiding principles, areas and competencies, and objectives and course descriptions aim to indicate broad outlines for the designing and developing of appropriate training programmes for technical and vocational teachers, including training officers and educational administrators. The content and depth of treatment in any training programme will depend upon such factors as the participants' educational backgrounds, the duration of the course, and the positions for which the teachers are being prepared. Pre-service training programmes may profitably include all the suggested areas and components in the initial preparation of vocational and technical teachers.

2. In-service Training Programmes

In some countries many practising vocational and technical teachers have not undergone any pre-service training programmes. They might, however, possess the requisite academic and technical qualifications. Some of them might have also received industrial training before or after employment or appointment as teachers. It is desirable to encourage them to undergo formal teacher training programmes on a full-time or part-time basis. Such in-service training programmes may have to be designed

with in-built flexibility to give exemptions or credits in technical subjects and/or industrial practice which they might have received already.

3. *Continuing Education Training Programmes*

In addition to the initial preparation of vocational and technical teachers through pre-service and in-service training programmes, it is desirable for them to undergo periodically, continuing education programmes to cope with increasing knowledge in technical specializations; new machinery, equipment and practices; innovative approaches in the design and development of curricula, new instructional material, methods, and evaluations; and the latest practices in educational management and research. For the enrichment of knowledge, skills and attitudes of the practising teachers in these and other relevant areas it is necessary to arrange suitably designed short courses, workshops, seminars, conferences, industrial visits, attachments and study leave and visits.

4. *Designing the Programmes*

Programmes may be designed and described in a variety of ways. In considering this aspect of the preparation of vocational and technical teachers, workshop members generally agree that the following design format could be helpful in reaching a full understanding and awareness of the goals, objectives, and form of any training programme:

i) Aims of the Course

ii) Course Objectives

iii) Course design

1) duration

2) entry requirements

3) intake description

4) general objectives

5) phasing and subject sequencing

6) Subject weighting

iv) *Course Outline*

1) *subject objectives*
2) *teaching methodologies*
3) *teaching aids and materials*

v) *Course implementation*

1) *facilities and resources*
2) *staffing*

vi) *Course Evaluation*

1) *weightage for formative assessment and summative evaluation*
2) *grades*

vii) *Course Certification*

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

The discussions and the sharing of experiences on the preparation of teachers for vocational and technical education at the two workshops led to the formulation of the following conclusions and recommendations. There is a strong feeling that all those concerned with vocational and technical teacher preparation should consider these conclusions and recommendations and where appropriate to local conditions implement them.

A. *General Education*

1. Observing that practical arts education is viewed as a significant introductory programme to vocational education in a number of countries and feeling that some of those countries have failed to allocate sufficient resources to the planning, implementation and evaluation of these programmes.

The workshops recommend to member countries:

1.1 That adequate attention be given to the funding of practical arts education;

1.2 That higher priority be given to the training of practical arts teachers; and

1.3 That more attention be given to the development of curricula in practical arts so that these programmes are more closely related to the local world of work.

The workshops recommend to APEID:

1.4 That steps be taken to improve the existing teacher preparation programmes for practical arts teachers by way of a range of regional inter-country and in-country activities.

B. *Vocational and Technical Education*

1. Concluding that few countries have fully implemented the practice of relating the planning and developing of their programmes in vocational and technical education to national manpower planning projections,

This workshops recommend to member countries:

1.1 That greater efforts be made to relate programmes in vocational and technical education to national manpower plans

2. Noting that many countries have not been able to allocate adequate funding and resources for the development of vocational and technical education,

The workshops recommend to member countries:

2.1 That efforts be made to allocate greater funding and resources for programmes in vocational and technical education.

3. Observing that in many countries vocational and technical education is administered by a number of controlling authorities and agencies in an uncoordinated manner,

The workshops recommend to member countries:

3.1 That attention be paid to promoting the development of structures and agencies for the better coordination of the various controlling bodies.

4. Deciding that all students undertaking studies in vocational education courses require a sound background in general education to prepare them for their studies,

The workshops recommend to member countries:

4.1 That the minimum standard of entry to most programmes in vocational education should be 9 years study in general education.

5. Concluding that the educational levels of courses

in technician education require a high standard of achievement by students in general education and specialist studies,

The workshops recommend to member countries:

5.1 That students graduating from technician courses of study should have reached a standard equivalent to 13-14 years education. This requirement could be met in a variety of ways to suit national systems of education e.g. 9 years + 5 years; 10 years + 3 years; 12 years + 2 years.

6. Realising that in a number of countries there is an inadequate supply of trained teachers to staff vocational and technical education programmes,

The workshops recommend to member countries:

6.1 That steps be taken to ensure that the salaries and conditions of service for vocational and technical education teachers are at least comparable to those with similar qualifications and experience in other fields of employment.

7. Concluding that there are insufficient bright and able young people seeking careers in vocational and technical fields,

The workshops recommend to member countries:

7.1 That steps be taken to enhance the status of people in the fields of vocational and technical employment by the provisions of salaries set at attractive levels with conditions of employment which are competitive with those in other fields, with opportunities for career advancement, and with the provision of continuing education programmes in their chosen vocations.

8. Determining that curricula in vocational and technical education in many countries do not take account fully of the rapidly changing educational needs of modern technology and accompanying social changes,

The workshops recommend to member countries:

8.1 That steps be taken to ensure that the curricula in vocational and technical education take account of technological changes, provide adequate opportunities for relevant work experience, and include appropriate studies in liberal and general fields;

8.2 That invitations be given to a wide range of interested parties to participate in the development of curricula; and

8.3 That priority be given to the provision of adequate opportunities for craftsmen, and technicians to participate in continuing education programmes that update their skills and knowledge in their fields of employment.

9. Noting that in some countries the systems of certification of graduating students in technical and vocational education and accreditation of teaching institutions are not fully developed,

The workshops recommend to members countries:

9.1 That priority be given to reviewing the existing provisions for student certification and institutional accreditation and that where necessary national systems of certification and accreditation should be developed.

It is recommended to APEID:

9.2 That priority be given to the development of regional schemes for reciprocal recognition of member country systems of student certification and institutional accreditation.

10. Observing that in many countries graduating vocational and technical students are not being given due credits or recognition by higher education institutions and are therefore being discouraged from pursuing higher education studies,

The workshops recommend to member countries:

10.1 That priority be accorded to the development of national systems which recognise and credit vocational and technical qualifications in institutions of higher learning.

C. *Vocational and Technical Teacher Training*

1. Noting that in a number of countries there are insufficient institutions for the training of vocational and technical teachers and that in some countries the existing institutions are not adequately staffed, funded, and provided with resources and facilities,

The workshops recommend to member countries:

1.1 That priority be given, according to national needs, to the establishment of institutions for the training of vocational and technical teachers; and

1.2 That steps be taken to ensure that all training institutions for vocational and technical teachers are provided with adequate funds, resources and facilities.

2. Concluding that in many countries vocational and technical teachers are starting teaching with inadequate ranges of relevant work experience and lacking appropriate qualifications,

The workshops recommend to member countries:

2.1 That vocational teachers be qualified to full secondary education or its equivalent, be qualified at least up to craftsman level, have had relevant work experience where practicable, and be qualified pedagogically at certificate or diploma level; and

2.2 That technical teachers be qualified to degree level or above in their specialist field, have had relevant work experience where practicable, be qualified pedagogically at diploma or degree

level.

3. Deciding that in many countries the curricula for the preparation of vocational and technical teachers are inadequate,

The workshops recommend to member countries:

3.1 That such curricula be designed to include pedagogical studies, industrial experience, subject specialisation, general and liberal studies, and educational research and management.

4. Discovering the lack of adequate and relevant continuing education programmes for vocational and technical teachers in a number of countries,

The workshops recommend to member countries:

4.1 That priority be given to providing opportunities for the continuing staff development of vocational and technical teachers; and

4.2 That continuing education programme should include:

- leave for further industrial experience;
- intra-and inter-institutional exchange programmes;
- seminars and conferences;
- overseas programmes;
- access to further education studies; and
- opportunities for research.

5. Deciding that in most countries there is a lack of coordination and articulation among pre-service, in-service, and continuing education programmes for vocational and technical teachers resulting in duplication of efforts,

The workshops recommend to member countries:

5.1 That priority be given to establishing mechanisms that ensure that all forms of training for vocational and technical teachers are co-ordinated

horizontally and articulated vertically.

6. Concluding that in most countries there are inadequate programmes in research and development in the preparation of vocational and technical teachers,

The workshops recommend to member countries:

6.1 That priority be given to a review of research and development programmes in vocational and technical education teacher preparation and that where necessary steps be taken to ensure that such activities are adequately funded;

6.2 That training programmes be set up for research personnel in the fields of vocational and technical teacher preparation; and

6.3 That mechanisms be set up to disseminate research findings nationally.

It is recommended to APEID:

6.4 That priority be given to the dissemination of research findings regionally;

6.5 That a regional research journal be published; and

6.6 That existing training programmes and seminars in research and development relating to vocational and technical teacher training be extended.

7. Finding that there is an inadequate supply of teacher trainers for the preparation of vocational and technical teachers in many countries,

The workshops recommend to member countries:

7.1 That special measures be instituted to attract suitable personnel to this field. These measures could include:

- payment of appropriate salaries;
- opportunities to engage in research and

development programmes;

- opportunities to act as consultants; and
- opportunities to exchange positions in other institutions, at home and abroad.

It is recommended to APEID:

7.2 That existing programmes in regional exchanges, workshops and seminars be extended.

8. Discovering that in many countries the preparation of the trainers for vocational and technical teachers is inadequate,

The workshops recommend to member countries:

8.1 That authorities responsible for teacher preparation ensure that the teacher trainers should

- have a sound knowledge of and experience in vocational and technical education;
- have had practical experience in industry and commerce; and
- have teaching qualifications and experience;

8.2 That member countries give priority to establishing formal training programmes for teacher trainers in vocational and technical education; and

8.3 That continuing education programmes be available in industry, in teaching institutions, and in institutions of higher learning.

It is recommended to APEID:

8.4 That a regional training centre be set up for teacher trainers in vocational and technical education; and

8.5 That study grants be made available to allow for training abroad when it is not available at home.

D. *Workshops in the Preparation of Vocational and Technical Education Teachers*

1. Concluding that the two workshops organised by the National Institute for Educational Research (NIER) of Japan have been beneficial to the participating members and their employing authorities in the furtherance of the development of programmes in the preparation of vocational and technical education teachers,

The workshops recommend to member countries:

1.1 That the combined report of the two workshops be widely distributed and discussed; and

1.2 That the recommendations be fully considered.

It is recommended to APEID and NIER:

1.3 That they sponser a range of programmes which provide support and encouragement for:

- more activity in research and development programmes in the preparation of vocational and technical teachers;
- more systematic developments of mechanisms for student certification and programme accreditation in vocational and technical teaching institutions;
- greater emphasis on the improvement of vocational and technical teacher preparation through the development and use of modular programmes such as performance based teacher education;
- more activity in the development of programmes for senior personnel in vocational and technical education in educational management and administration.

ANNEX I

LIST OF PARTICIPANTS

A. First Workshop (6 - 28 March 1981)

I. PARTICIPANTS

Australia	Mr. R. Gordon Tasker Director Educational Services Department of Further Education GPO Box 2352 Adelaide
Bangladesh	Mr. M.T.C. Miah Deputy Director Technical Education Directorate of Technical Education Ministry of Education Dacca
India	Professor T. Subbarao Principal Technical Teachers' Training Institute Adyar Madras 600020
Indonesia	Mr. Edy Hidayat Vice Director Technical Teacher Upgrading Centre JL. Dr. Lum No. 9 Bandung
	Mr. Pudyo Sumedi Centre of Vocational Training Jakarta
	Mr. Saiman Technical High School Jogjakarta

Japan	Mr. Osamu Sekiguchi Subject Specialist (Industrial Sciences) Vocational Education Division Elementary and Secondary Education Bureau Ministry of Education, Science and Culture Tokyo
	Mr. Shoji Murata Curriculum Specialist Vocational Education Division Elementary and Secondary Education Bureau Ministry of Education, Science and Culture Tokyo
	Mr. Shigeyasu Nakamura Chief Section for External Relations External Service Department NIER Tokyo
Korea, Republic of	Professor Jaewon Lee Professor (Technical Didactics) College of Industrial Education Chungnam National University Daejon 300-31
Malaysia	Mr. Abu Sapian Jasin Lecturer Technical Teachers Training College Cheras Road Kuala Lumpur
Nepal	Mr. Mohammad Alam Khan District Education Officer Bardia Bheri

New Zealand	Miss Jean M. Herbison Associate Director Christchurch Polytechnic P.O. Box 22095 Christchurch
Pakistan	Mr. Sayed Wahab Head Teacher Trainer Technical Teacher Training Centre Govt. Polytechnic Institute Peshawar
Philippines	Mr. Alberto Poblete Chairman Professional and Vocational/ Technical Education Technological University of the Philippines
Singapore	Mr. Ooi Teik Beng Instructor Trainer Resource and Staff Training Centre Vocational and Industrial Training Board Singapore
Sri Lanka	Mr. A. Gautamadasa Principal Polytechnical Institute Galle Galle
Thailand	Professor Swath Tscheikuna Rector Institute of Technology and Vocational Education Office of the Rector, Thewes Campus Samsen Road Bangkok
	Mr. Pratana Ngarmrongvan Institute of Vocational Training Chonburi

Viet Nam	Professor Nguyen Xuan Tai General Department of Vocational Education Hanoi

II. RESOURCE PERSON

Dr. Yoichi Ikemoto	Director of Department IV Tokyo Gakugei University Koganei City Tokyo

III. SECRETARIAT

Mr. Masao Shuhara	Deputy Director-General and Director of External Service Department NIER
Dr. Kihei Koizumi	Chief, Section for Educational Co-operation in Asia External Service Department
Mr. Miharu Kajita	Section for Educational Co-operation in Asia External Service Department
Mr. Nobuya Higuchi	Ditto
Mr. Ryo Watanabe	Ditto

B. Second Workshop (28 January to 19 February 1982)

I. *PARTICIPANTS*

Australia

Mr. Greg Woodburne
Programme Director
Institute of Technical and Adult Teacher Education
P.O. Box K12
Haymarket
Sydney, NSW 2000

Bangladesh

Mr. Md. Habibur Rahman
Inspector
Vocational Training Institute
P.O. Custom House
Khulna

India

Prof. T. Subbarao
Principal
Technical Teachers' Training Institute
Adayar
Madras 60020

Mr. V.A. Sivagnamam
Joint Director
Vocational Education
Tamilnadu

Japan

Mr. Shoji Murata
Curriculum Specialist
Vocational Education Division
Elementary and Secondary Education Bureau
Ministry of Education, Science and Culture
Chiyoda-ku, Tokyo

Mr. Jiro Yoshio
Associate Professor
Department of Technical Education
Tokyo Gakugei University
Koganei-shi, Tokyo

Japan	Mr. Shigeyasu Nakamura Chief Planning Section External Service Department NIER Meguro-ku, Tokyo
Korea, Republic of	Dr. Sung-Ho Lee Assistant Professor Dept, of Education Yonsei University Seoul
Malaysia	Mr. Abu Sapian Jasin Lecturer Technical Teachers Training College Cheras Road Kuala Lumpur
Maldives	Mr. Mohamed Hameed Chief Co-ordinator Vocational Training Centre Male
Nepal	Mr. Tanka Nath Sharma Vice Principal Karnali Technical School Jumla c/o P.O. Box 126 Kathmandu
New Zealand	Mr. Maurice H.A. Pentecost Education Officer Continuing Education P.O. Box 2612 Southern Regional Office Department of Education Christchurch

Pakistan	Mr. Safdar Hussain Gurmani Head Technical Education Department Government Polytechnic Institute Haripur
Philippines	Mrs. Carmen U. Bonaga Chief Client Assessment and Counselling Division Office of Vocational Preparation National Manpower and Youth Council South Superhighway, Tagig Metro Manila Manila
	Mrs. Perla S. Roxas Director Planning, Research and Development Technological University of the Philippines Ayala Boulevard P.O. Box 3171 Ermita, Manila
Singapore	Mr. Ooi Teik Beng Instructor Trainer Resource and Staff Training Centre Vocational and Industrial Training Board Singapore
	Mr. Charles S.S. Lee Training Manager Vocational and Industrial Training Board P.O. Box 465 Tanglin Post Office Singapore 9124

Thailand	Mr. Charnchai Siriwat Associate Dean Faculty of Engineering Technology Institute of Technology and Vocational Education 399 Samsen. Rd. Tewes Ministry of Education Bangkok
Viet Nam	Prof. Nguyen Xuan Tai General Department of Vocational Education 106 Tran Hung Dao Hanoi

II. RESOURCE PERSON

Dr. Yoichi Ikemoto	Director Department IV Tokyo Gakugei University Tokyo, Japan

III. SECRETARIAT

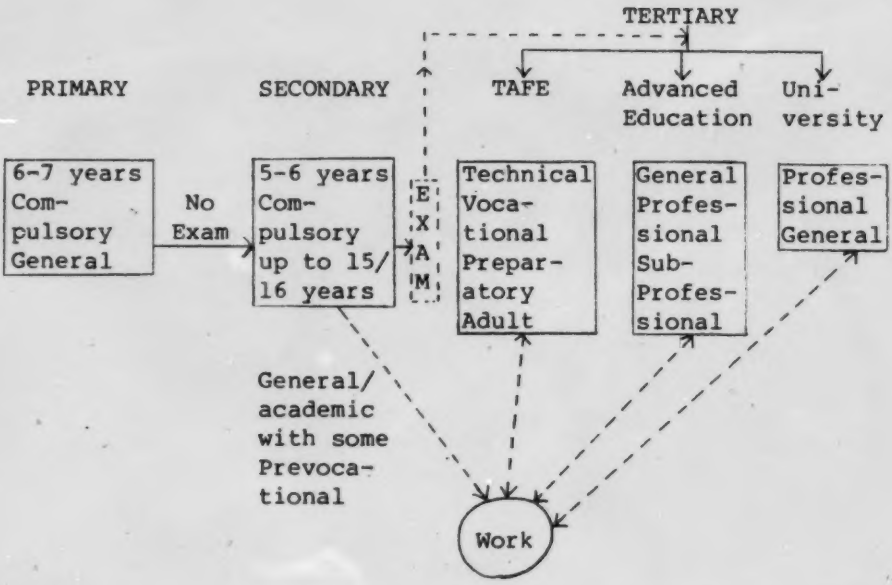
Mr. Taichi Sasaoka	Director External Service Department NIER
Mr. Toshio Kanaya	Chief Section for Educational Co-operation in Asia External Service Department
Mr. Miharu Kajita	Section for Educational Co-operation in Asia External Service Department
Mr. Nobuya Higuchi	Ditto
Mr. Ryo Watanabe	Ditto

ANNEX II

SUMMARIES OF COUNTRY REPORTS

AUSTRALIA

I. The Education System



Notes

(A) Full-time students make up about five percent of TAFE enrolments, seventy-five percent of College of Advanced Education enrolments and eight-five percent of university enrolments.

(B) Education is the responsibility of the States (7), so there is no one system of education in Australia. The national government, however, co-ordinates higher education which it fully funds, and provides some funds for schools and TAFE colleges.

1. Secondary High Schools

Most students follow a general, liberal studies programme at comprehensive high schools. There is some pre-vocational education, which is orientation to the world of work, plus some basic skills and knowledge in subjects such as woodwork, metalwork, technical drawing, home economics and commercial studies. Only one State, Victoria, has more specialised technical high schools.

2. Higher Education

Successful high school students who have matriculated (similar to English "A" levels) may enter colleges of advanced education (C.A.E's) or universities (Uni's). Career programmes (as well as liberal studies) are taught and lead to awards of Associate Diploma (2 years full-time study-C.A.E.), Diploma (3 years - C.A.E.), Bachelor's Degree (3 or 4 years in C.A.E. or Uni.), Master's Degree (additional 1 or 2 years, usually at a Uni.) and Doctor's Degree (1, 2 or 3 years, depending on previous qualifications, at a Uni.), and Graduate Diplomas (1 year, C.A.E.'s + Uni.)

The higher education career courses are for the professional levels in industry, commerce and the community, e.g. professional engineers, architects, accountants, teachers, doctors and lawyers.

II. Vocational and Technical Education

Vocational and technical education, as defined at this Workshop is almost entirely provided in colleges of Technical and Further Education (TAFE); that is, for craftsman and for technicians (lower and higher). The further education of adults, (remedial literacy and numeracy, leisure and enrichment courses, bridging and preparatory courses) will not be discussed.

The students have left school, usually are employed are largely adult with 64% being 20 years of age or more, and most (95%) study part-time. There are some 200 colleges of T.A.F.E. with most having branches resulting in over 1,000 separate locations. Courses are also taught by correspondence using various media. T.A.F.E. graduates

form the bulk of the skilled work force at sub-professional levels are usually awarded a Certificate.

About 80% of the teaching is done by the full-time teachers, (nearly 12,000) and the rest by part-time teachers. The full-time teachers are permanent civil servants, average about 33 years of age on recruitment, have been employed in industry or commerce, on the average 13 years, and are qualified in their particular professions before becoming teachers.

[N.B. No mention is made here of vocational and technical education provided for employees directly by the organizations who employ them.]

III. Vocational and Technical Teacher Training

1. Initial Teacher Education

1.1 Teacher Recruitment and Teacher Education Requirements

Almost all teachers are recruited from industry and are chosen because of their professional qualifications and the length and quality of their industrial experience. At the point of selection, very few would have a formal teaching qualification, though some would have taught part-time in a TAFE college or in another kind of institution or as a trainer in industry. If untrained as a teacher the recruit must undergo a formal course of teacher education.

1.2 Conditions of Release for Teachers of Vocational and Technical Education

New teachers are on a full salary while training as teachers. They attend the teacher education institution over a period usually, of two years, either by day release or block release, most are released for the equivalent of twenty-two hours per week for one year.

Their teaching loads are reduced in this period in proportion to the time spent at the teacher education institution.

1.3 The Institutions Providing Teacher Education

There are institutions in all the states and territories that provide courses specifically designed for vocational and technical teachers. They are colleges of advanced education and also usually provide courses for primary and or secondary teachers. Some also provide courses for other professionals, e.g. engineers.

1.4 Co-operation between the Institutions and the Employing Authorities

Co-operation varies from joint advisory committees to actual participation in the delivery of the course by officers of the employing authority. New teachers generally are on probation and must be favorably assessed by both the employer and the teacher education institution before they are offered permanent employment

1.5 Induction Programmes

Short intensive induction programmes are usually run full-time at the beginning of a teacher's career. They are normally a joint effort by the employer and the institution.

1.6 Courses of Awards

Most institutions provide separate courses for vocational and technical teachers. Where there are two such courses, vocational teachers study for the equivaleht of three years full-time and receive a diploma of teaching (Dip Tch): technical teachers study for the equivalent of one year full-time and receive a diploma of education (Dip Ed.).

An increasing number of institutions provide a bachelor of education (B Ed) which vocational teachers can obtain by working for the equivalent of one extra year full-time (after completing the Dip Tech.). This extra study would be undertaken in their own time.

1.7 Modes of Delivery

Most study is face-to-face; however, distance

programmes are provided for some teachers recruited in outlying centres.

1.8 Teaching Practice and Supervision

Most teachers have classes for which they are fully responsible during their training period. In this period they are observed and helped by staff from the teacher education institutions and supervised by senior staff from the employing authority.

2. Post Initial Education

As professional, teachers are expected to keep up-to-date with educational developments and with new technology and processes in their technical fields. Many upgrade their qualifications both teaching and technical, by doing courses in their own time and at their own expense.

It is the employers, however, who provide the majority of post-initial education. This is carried out through a vast array of workshops, conferences, seminars, scholarships, teacher exchanges, paid industrial leave and study tours.

In recent years these programmes have received very heavy financial support from the national government.

IV. Problems - Innovations - Issues

1. Initial Teacher Education

Problems:

(a) Recruiting suitable staff for the teacher education institutions.

(b) Insufficient release time from teaching for teacher trainees.

(c) Heavy work load of trainee. Combination of work and study.

(d) Varying entry standards of trainees in their basic general education.

(e) Lack of research on teaching and learning in vocational/technical education.

(f) Lack of suitable resource materials, particularly software.

(g) Vast variety and small number of trainees in specific technical fields makes specialised assistance very costly or often impossible.

(h) The range of students that the trainees are teaching, calls for a variety of special programmes e.g. for those teaching the socially and physically handicapped and minority ethnic groups.

(i) Many students undertaking the Diploma of Teaching will either never finish the course or it will take them up to eight years.

(j) New teachers can have deficiences in their industrial experience that create problems for them in their teaching.

(k) The change from practitioner to teacher can create serious personal and family problems for the new teacher.

Innovations:

(a) Introduction of distance education programmes.

(b) Introduction of degree programmes.

(c) Introduction of performance based teacher education.

(d) Development of a national syllabus in educational psychology, designed especially for vocational/technical teachers.

(e) Development of a range of stimulus and model teaching films and of other materials especially designed for vocational/technical teachers.

(f) Introduction of instruction in computer applications in teaching.

Issues:

(a) Whether vocational and technical teachers should undergo the same initial teacher education course.

(b) Whether vocational teachers should be given credit in the teacher education course for their previous vocational qualifications and work experience.

(c) Whether courses of teacher education should include traditional studies in liberal/general studies.

(d) Whether initial teacher education should include content studies in the teacher's technical discipline.

2. *Post Initial Education*

Problems:

(a) Large distances between colleges lead to professional isolation for many teachers.

(b) Rate of technological and educational change makes it impossible for the authorities to keep all teachers up-to-date in all disciplines.

(c) The physical isolation of Australia makes it very costly to sponsor overseas study trips by teaching staff.

(d) The wide range of occupations being taught in the colleges means that the smaller disciplines have to struggle for funds for continuing education.

Innovations:

(a) A wide range of programmes for all levels of

management, concerned with coping with and managing change.

(b) The establishment of a national clearing house for disseminating research information.

(c) The creation of a large programme of activities organised and carried out at the local college level.

Issues:

(a) How far is the individual teacher responsible for his own continuing professional development.

(b) Whether or not all vocational and technical teachers should be given regular leave for professional renewal and development.

(c) Whether programmes should be organised and controlled from the grass roots or from the top.

(d) How far is it possible or desirable to keep up-to-date with all aspects of change in all the occupations being taught.

(e) Is it possible or necessary to train all part-time teachers.

(f) How to get the maximum working from industry of projected major technological innovations.

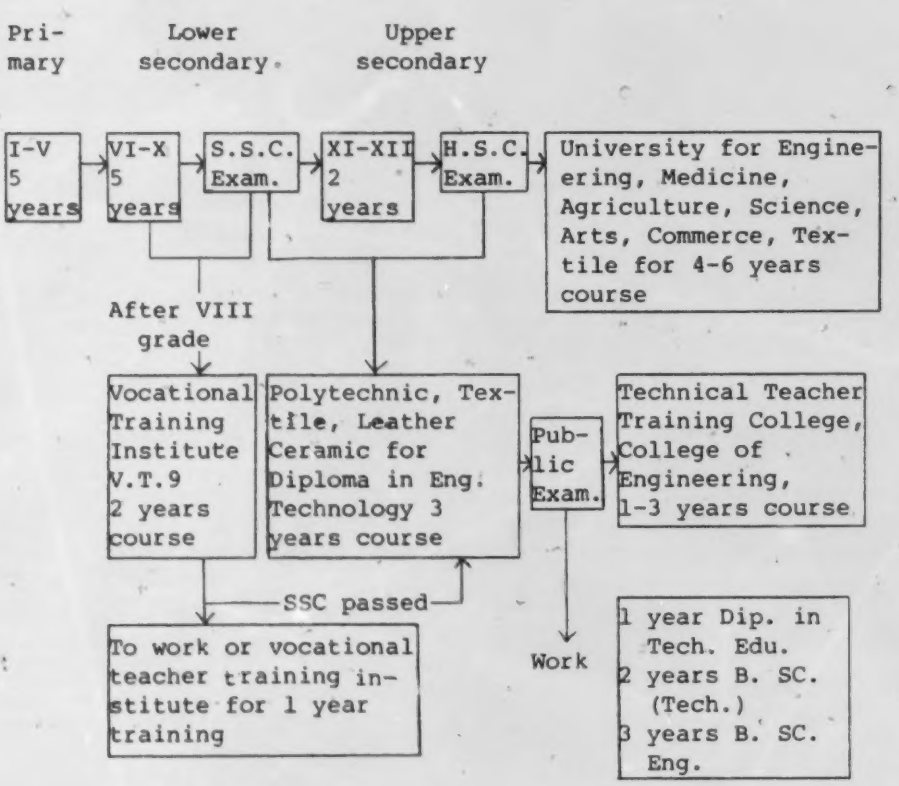
(g) How to develop supervisory and management staff, at all levels, who will cope with the demands and pressures of the next twenty years.

BANGLADESH

I. The Education System

The system of education in Bangladesh can be classified into the following five stages:

1. Primary (grades I - V)
2. Secondary (grades VI - X)
3. Higher Secondary (grades XI - XII)
4. Graduation
5. Post Graduation


Pri-mary
Lower secondary
Upper secondary
I-V 5 years
VI-X 5 years
S.S.C. Exam.
XI-XII 2 years
H.S.C. Exam.
University for Engineering, Medicine, Agriculture, Science, Arts, Commerce, Textile for 4-6 years course
After VIII grade
Vocational Training Institute V.T.9 2 years course
Polytechnic, Textile, Leather Ceramic for Diploma in Eng. Technology 3 years course
Pub-lic Exam.
Technical Teacher Training College, College of Engineering, 1-3 years course
SSC passed
To work or vocational teacher training institute for 1 year training
Work
1 year Dip. in Tech. Edu.
2 years B. SC. (Tech.)
3 years B. SC. Eng.

Primary education is free but not compulsory; books are supplied to the primary students with a very nominal cost. The diversification starts at grade VIII. The major areas are science, arts, commerce and industrial arts. The courses offerred by the vocational training institutes are of two years duration.

II. Vocational and Technical Education

Industrial arts courses are offered in the secondary level after grade VIII. Students can go to vocational training institutes (VTI) after completing grade VIII, to undergo two years of trade courses. Students having S.S.C. and trade certificates may go for diploma-in-engineering courses.

After passing the S.S.C. examination with good marks in math. and science students may sit admission tests for Diploma in Engineering/Technological courses in Polytechnics and Monotechnics. A large number of students come after passing the H.S.C. examination. They are those who cannot gain entry to the engineering colleges. In all the professional colleges and universities the students are admitted by competitive admission tests. The University of Engineering and Technology offers both graduation and post graduation courses of 4 to 5 years duration.

III. Vocational and Technical Teacher Training

Technical Teachers' Training College (TTTC) was established in the year 1964, the college initially organized a one year diplomacourse with an affiliation of the Board of Technical Education (BTEB). The college started the B. Ed. (Technology) course in the year 1968, on being affiliated with the University of Dacca as a constituent college. The experiences gained under this course led to the introduction of the B.Sc. (Technical Education Courses) in 1974.

Admission requirements:

Diploma-in-Engineering in the relevant field or its equivalent.

Duration of the course is one academic year.

For admission into the course for the degree in B. Sc. in Tech. Edu. students must have gained a Diploma-in-Technical Education from the BTEB, or an equivalent diploma from any Board/University recognized by the BTEB. Duration of the course is two academic years.

Departments:

1. Education, humanities, and related subjects
2. Civil Engineering
3. Electrical Engineering
4. Mechanical Engineering

Diploma in Technical Education Curriculum:

1.	Mathematics	9%
2.	Science	25%
3.	Humanities (Language)	6%
4.	Pedagogy	27%
5.	Specialized Subjects	33%

B.Sc.- in-Technical Education Curriculum:

1.	Mathematics	7.5%
2.	Pedagogy	22.5%
3.	Humanities	12.5%
4.	Science	10%
5.	Specialized Subjects	47.5%

Vocational teachers training institute (VTTI) is being established to train teachers of VTI's and expected to start functioning from early 1982. Curriculum, course content and duration of the course are under process of development.

There is a modular form of teacher training programme for the teachers of polytechnic institutes and the teacher training programme for vocational and technical teachers is in-service in nature.

Vocational teachers come from: Polytechnics, industries, and Vocational Institutes.

Polytechnic teachers come from: Engineering College, Technical Teacher Training College, Industries, and Polytechnics.

Polytechnic and monotechnic teachers are being industrially trained by way of short term placements in appropriate organizations.

IV. Problems - Innovations - Issues

Problems:

1. Shortage of suitably qualified persons for staffing the technical and vocational institutes.

2. Difficulty of recruiting and retaining qualified and experienced teacher in the institutions.

3. Inadequate supply of equipment and appliance.

4. Shortage of qualified and experienced teacher trainers.

Innovative Measures Taken:

1. To meet the shortage of teachers in the polytechnics selected teachers with good academic backgrounds are being sent to the Technical Teachers Training College to upgrade their academic qualifications and teacher training.

2. Technical teachers are being sent to industry for in-plant training during the long vacation through the summer science institute programme.

3. Fresh Diploma holders are sent to the industries/organizations for industrial training to expose them to industrial atmosphere. Preference is given to this type of candidate in making appointments.

Issues involved:

1. The teaching job requires to be made more attractive, in comparison with other equivalent jobs outside.

2. The migration of qualified and experienced teachers requires control by the formulation of a national policy.

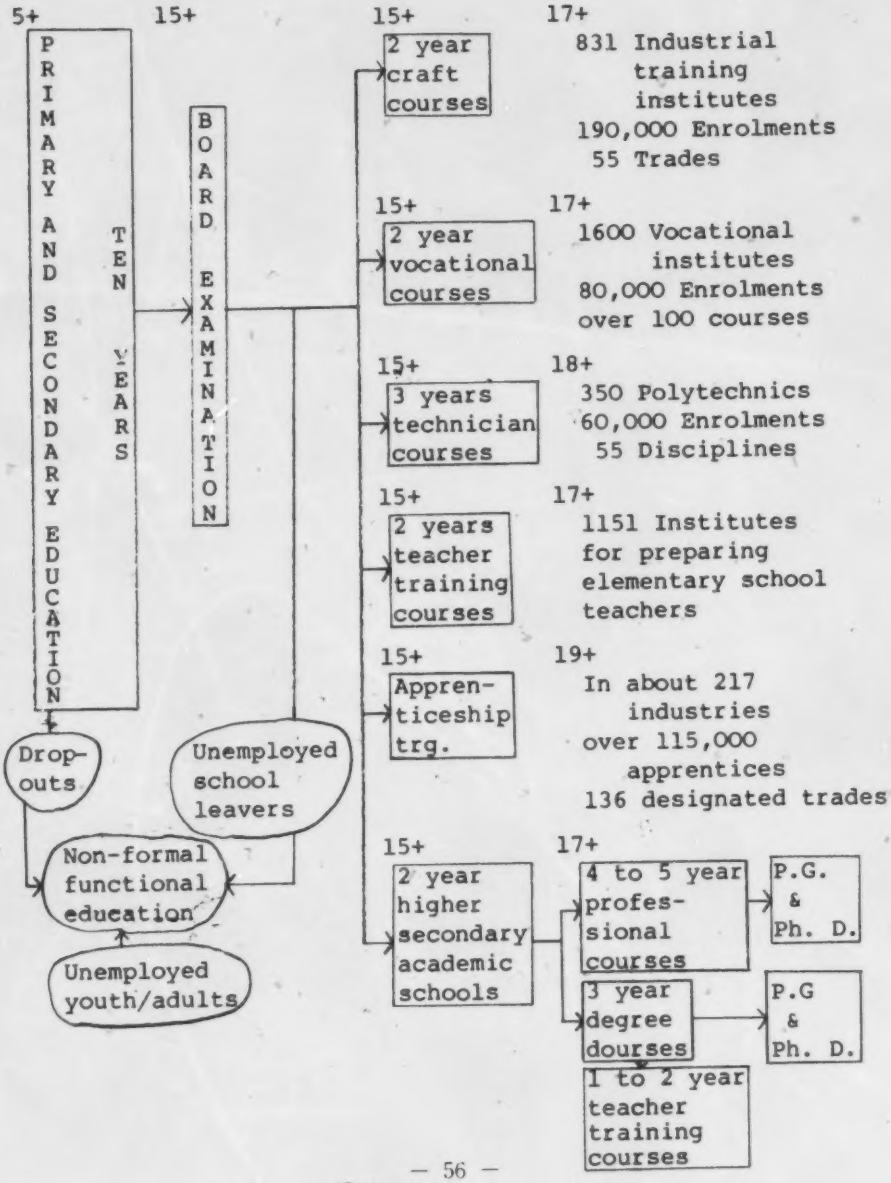
3. Teacher training programmes require to be strengthened by the opening of new technical teacher training colleges to provide pre-service training.

4. More funding is necessary for vocational and technical education to finance the supply of the required equipment, appliances and raw materials.

INDIA

I. The Education System

1. The essential features of general education in India may be schematically characterised as under:



2. Education in India is administered by the State Governments. The Central Government, however, lays down the norms and standards for maintainance and improvement of quality of education. The National Council of Educational Research and Training (NCERT) prepares model curricula and develops instructional material for adoption in schools by the State Governments. It is also currently assisting the efforts of the State Governments in popularising vocational education at higher secondary level. The National Council for Training in Vocational Trades (NCTVT) advises the Central Government in the formulation of national policies for trade and craft courses. The Central Apprenticeship Council (CAC) regulates the implementation of provisions of the Apprentices Act, 1961 under which it is obligatory for employers in specified industries to engage apprentices and arrange for their training. The All India Council for Technical Education (AICTE) is the apex body for the maintenance of standards in technical and technician education. The University Grants Commission (UGC) coordinates education at university level. The All India Board for Adult Education develops policies for implementation of non-formal education for adults and youth.

II. Vocational and Technical Education

1. At school level, Socially Useful Productive Work (SUPW) is offered as one of the subjects to introduce the students to the world of work on a non-vocational basis.

2. Craftsman training programmes are offered in 53 trades to high school leavers in 831 Industrial Training Institutes (ITIS) admitting over 190,000 students. The courses are usually of 2-year duration. National Trade Certificates are awarded to successful candidates on behalf of NCTVT.

3. The Apprentices Act, 1961 makes it obligatory for employers in specified industries to engage apprentices. The apprenticeship training consists of basic training, followed by on-the-job or shop floor training with related instructions. Until now, 217 industries have been specified to train the apprentices in 136 designated trades under the Act. About 115,000 apprentices are currently undergoing training in public and private sector undertakings. At the end of training, the apprentices are trade

tested by NCTVT and the successful candidates are awarded the National Apprenticeship Certificates.

4. In keeping with the national policy, many states have recently introduced vocational education at +2 level after 10 years of secondary education. More than 100 vocational courses have been designed and developed in the broad areas of Agriculture, Industry, Commerce, Banking, Health and Home Sciences. The present enrolment exceeds 80,000 spread over in about 1,600 vocational schools.

5. Technician courses are offered in about 350 polytechnics with an intake of about 60,000 students in 55 disciplines. Of these, 24 polytechnics are exclusively for women, offering courses in 18 disciplines of special interest to them. The duration of the technician courses ranges from 2 to 4 years, 3 years being the most common, after 10 years of schooling. The patterns include full-time, part-time, sandwich and post-diploma courses. The State Boards of Technician Education award Diplomas to the successful candidates.

III. Vocational and Technical Teacher Training:

1. Pre-service training programmes for preparing vocational and technical teachers are not popular in India as teacher training is not an essential condition for joining the teaching profession at this level. The importance of training and retraining of teachers have however been recognised and the teachers are encouraged to undergo in-service and continuing education programmes on a priority basis.

2. Preparation of vocational and technical teachers takes place under the following major headings:

a) teachers for socially useful productive work,

b) instructors for trade/craft courses,

c) teachers for vocational education,

d) teachers for technician education,

e) trainers in the training departments of industrial establishments, and

f) teachers for special purpose institutes for rehabilitation of the handicapped, rural youth, unemployed adults, women and school drop-outs.

3. The course patterns include

a) full time courses,

b) part-time courses,

c) correspondence-cum-contact programmes,

d) modular courses,

e) industrial/vocational training, and

f) short courses, workshops, seminar, conferences and study visits.

4. The curriculum is designed to cover the following major areas of study:

a) latest knowledge of the subject matter,

b) related industrial practices,

c) pedagogical studies,

d) educational research and management, and

e) teaching practice.

5. The main training programmes offered in Central Training Institutes (CTIS) are:

a) one year regular instructor course in skill development and principles of teaching/ learning,

b) 6 month refresher courses to update the knowledge and know-how of the instructors,

c) $1\frac{1}{2}$ year re-training courses for trained instructors whose parent trades have become obsolete,

d) special courses for instructors in diversified trades, and

e) short courses and workshops for continuing education.

6. The training programmes offered to technician teachers by Technical Teachers Training Institutes include:

a) 1 to $1\frac{1}{2}$ year Diploma in Technical Teaching (Dip. T.T.) for diploma in engineering and technology,

b) one year Bachelor of Technical Education (B. Tech. Ed.) for graduates in engineering and technology,

c) 1 to $1\frac{1}{2}$ year Diploma in Science Teaching (Dip. Sc. T.) for post-graduate teachers in sciences and mathematics,

d) 6 month certificate course in Technical Teaching (Cert. T.T.) for teachers in diversified disciplines,

e) 3 month modular programmes in

- educational technology
- educational management and administration
- pedagogical studies
- educational research
- curriculum design and material production, and

f) short courses and workshops for continuing education.

IV. Problems - Innovations - Issues:

1. Some problems are concerned with the:

a) unwillingness on the part of bright students to join vocational and technical courses for fear of low status and lack of opportunities for career development and higher education;

b) ineffective instruction due to a large number of untrained teachers and inadequate facilities and resources;

c) poor responses to teacher training programmes due to an inadequate subsistence allowance, separation from families for long spells of time, unfilled positions in sponsoring institutions, want of incentives for trained

teachers and the lack of relevance in training programmes; and

d) shortages of qualified and experienced teacher trainees.

2. Some innovations relate to the:

a) establishment of 'Media and material production centres';

b) setting up of 'National Testing Service Cells' (Item Banks) for measurement and evaluation;

c) Introduction of Competency Based Teacher Education (CBTE);

d) establishment of extension centers to assist the local clientele institutions for planned changes for development.

3. Some major issues pertain to the:

a) making of teacher training compulsory either through pre-service or in-service training programmes;

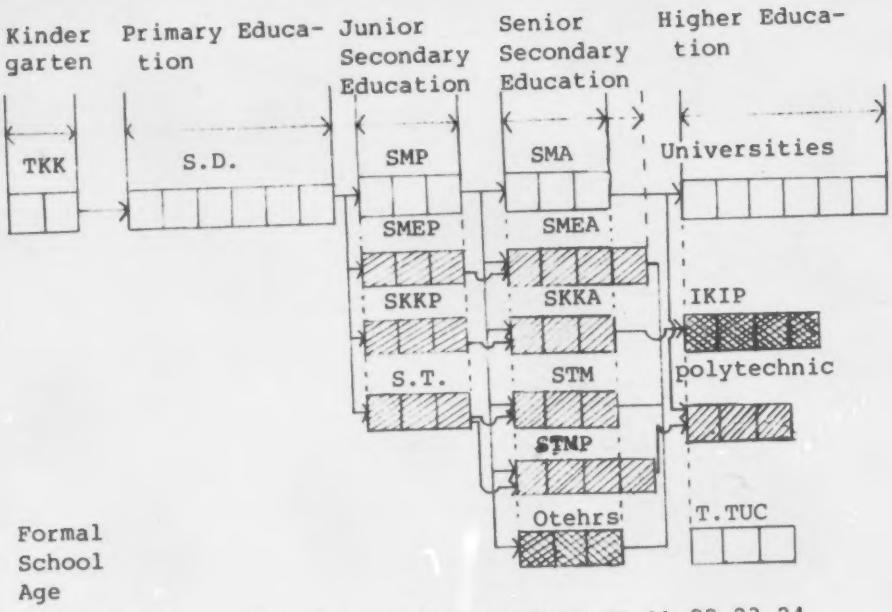
b) establishment of teacher training institutes for vocational teachers;

c) offering of seperate teacher training programmes for teachers to teach SUPW in schools; and

d) need to establish a National Institute for the Training of Trainers and Research and Development in Vocational and Technical Education.

INDONESIA

I. The Education System



Note

Vocational and Technical Education

Teacher Training Including Vocational and Technical Teacher Training

1) TKK = Kindergarten
2) SD = Primary School
3) SMP = General JSS
4) SMA = General SSS
5) SMEP = Business JSS
6) SKKP = Home Economic JSS
7) ST = Technical JSS
8) STM = Technical SSS
9) SKKA = Home Economic SSS
10) SMEA = Business SSS
11) STMP = Developing Technical SSS
12) Polytek = Polytechnic
13) Universities = University
14) IKIP = Institute of Teacher Training and Education Science
15) T.TUC = Technical Teacher Upgrading Centre

II. Vocational and Technical Education

Vocational education starts in the Junior Secondary School (JSS): Three years courses after primary school (Grade 7, 8 and 9). Most of the school leavers enter vocational and technical schools at Senior Secondary School (SSS) (Grade 10, 11, 12 or 13).

School leavers from 12th grade vocational school become tradesmen, school leavers from 13th grade become lower technician, and both school leavers may continue their education to the higher education after two years working.

At the present time there is only one polytechnic run by the government under the Directorate General of Higher Education, and another six will be added in 1982. The students of the polytechnic come from general Senior Secondary School (SMA). The course education is three years (grade 14-15-16). The school leavers become technicians.

III. Vocational and Technical Teacher Training

1. Pre-service

Pre-service vocational and technical teacher training is run by the teacher training college known as IKIP (Institute of Teacher Training and Educational Science) under the Directorate General of Higher Education.

Most of the students are graduates of given general senior secondary schools. Only the ten best students from each school are accepted for vocational and technical education.

2. In-service training

The Directorate General of Primary and Secondary Education and the Directorate of Vocational and Technical Education realized the urgency in staffing the vocational and technical schools with properly trained qualified staff. In 1980 Indonesia embarked on plans to establish an in-service diploma course for vocational and technical teaching. The Technical Teacher Upgrading Centre (TTUC), Bandung was given the responsibility to plan and implement a new in-service diploma course for teacher training in January

1981.

The implementation will be done in stages, each lasting six semesters. Semesters II, IV and VI will be conducted at school, covering guided teaching practice and paper preparation in the form of a report or term paper.

IV. Problems - Innovations - Issues

A proposal has been made to establish a centre known as the Vocational Education Development Centre (VEDC). It is planned that the existing TTUC will become an integral part of the VEDC.

The actual staffing and organization of the VEDC is still very much in the planning stage. However, under the VEDC concept the TTUC will become the Staff Development Unit (SDU). It will implement the staff development and training need of teachers. Other units conceived in the VEDC are the curriculum development unit, facilities development unit, and the industrial liaison and systems development unit. The long term plan envisages several regional VEDCs, which will be established at centers currently being planned as technical teacher upgrading centers, e.g. Medan and Malang. The VEDC to be established at Bandung will probably become the national UEDC.

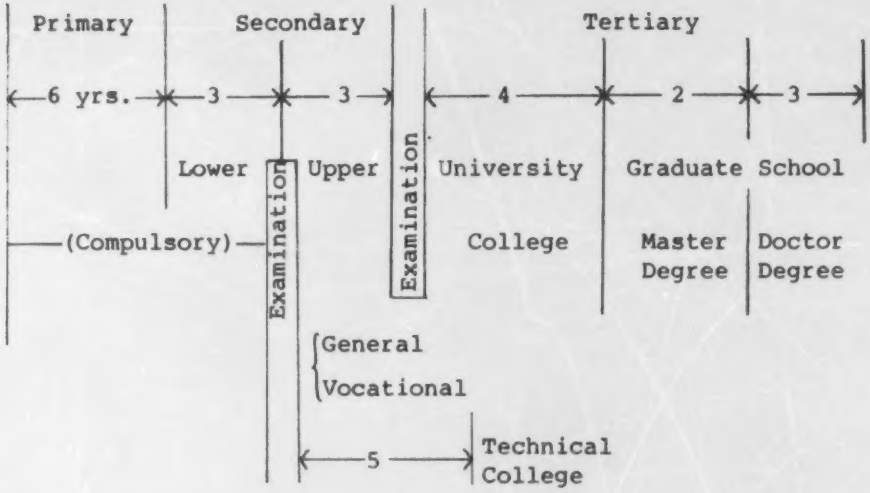
There is a shortage of skilled and qualified teaching staff in vocational and technical education in Indonesia. The vocational and technical teaching profession is considered to be unappealing as a job.

The current system of pre-service training of vocational and technical teachers is insufficient for solving the problem because it is not oriented towards the provision of vocational and technical teachers.

Vocational and technical teachers need special training because they are responsible not only for the quality and kind of workshop training given in the school, but also for the effective placement of their students in a job.

JAPAN

I. The Education System



II. Vocational and Technical Education

1. Lower Secondary Education (7th - 9th grades)

All the students are required to study Industrial Arts (IA) and Homemaking. The number of required classroom periods per year is 70 each in 7th and 8th grades, 105 in 9th grade.

The subjects consist of the following areas:

Wood Word Metal Work Machinery Electricity and Electronics Cultivation	mainly for boys
Clothing Food Housing Child Care	mainly for girls

2. *Upper Secondary Education (10th - 12th grades)*

About thirty per cents of the students of upper secondary schools are enrolled in vocational and technical courses. (Industry 10.1%, Business 12.3%, Agriculture 3.6%, Home Economics and others 4.6%). Vocational and technical course students are required to take twenty seven to thirty credits (one credit is thirty five classroom periods per year) on general subject areas, more than thirty credits on vocational and technical subjects and six credits on home-room.

More than fifty per cent at the timetabled hours are taken up by technical subjects with the emphasis being upon experiments and vocational practices and skills.

Types of Courses (in 1981)

Subject	Industry Related	Business Related	Agriculture Related	Fishery Related
Basic Subjects	4 Subjects	4 Subjects	2 Subjects	2 Subjects
Specialized Subjects	13 Key Courses	4 Key Courses	8 Key Courses	3 Key Courses
Number of Students	471,106	595,231	168,063	17,209

3. *Tertiary Education*

About thirty seven per cent of the upper secondary school graduates go to colleges and universities. The number of students enrolled in universities is 1,741,494; in junior colleges, 366,349; and in technical colleges, 46,348 (as of 1980). Distribution of university and college students classified by courses is given below:

	Humanities	Social Sciences (Incl. Business)	Engineering	Agri.	Education	Others
Universities	13.7%	40.5%	19.4%	3.4%	7.9%	15.5%

	Home Economics	Education	Social Science	Engineering + Agri.	Humanities	Others
Junior Colleges	26%	24.4%	9.1%	6.5%	21.5%	11.8%

4. Vocational Training

There are three types of training courses offered by the Ministry of Labour: 1) upper secondary level technical training; 2) renewal training for middle aged workers; and 3) instructor training. Trainees are assigned to one of the following trade groups: Machinery Group; Metalic Group; Electrical Group; Architectural and Interior Group; and Chemical Group.

III. Vocational and Technical Teacher Training

Teachers	Qualifications	Period/ level of ed./ training	Subjects (credits)	
IA Education Lower Secondary	Graduates of Univ. or College (Engineering) (Agri.) (IA. Teach.) (Courses)	4 years post-secondary	General (30-36) Pedagogical (30-34) Foreign Languages (10-12) Specialised (40-60)	M* O E
Voc.-Tech. Education Upper Secondary	Graduates of Univ. (Post-graduate degrees in V/T Faculty)	4 or 6 years post-secondary	General (36) Pedagogical (30) Foreign Languages (12-) Specialised (40-)	
Vocational Training	Institute of Vocational Training	4 years post-secondary or at Institute of Vocational Training	General (30) Foreign Languages (12) Primary Subjects (10) Pedagogical Subjects (23) Specialised Theory (60) Trade Practice (40) Other	M* O L

* Industrial arts (IA) teachers' and vocational technical teachers' certificates are issued by boards of education under the supervision of the Ministry of Education (MOE), whereas vocational training instructors' certificates are issued by the Ministry of Labour (MOL).

Teachers in technical subject areas at technical upper secondary schools are trained mainly in the 4-year courses of relevant specialised subject areas, such as courses of mechnaical engineering or of electrical engineering in an engineering faculty of a university. Minimum requirements for the completion of these courses are successful acquisition of one hundred and thirty eight credits in four years (one credit is given for fifteen hours of lectures attendance and for forty five hours of practical training or laboratory work) which are sub-divided into the following thirty six credits of general education subjects covering the fields of humanities, social sciences and natural sciences; fourteen credits of physical education, eight credits of foreign languages; and sevenry six credits in the specialized subject area. This training pattern can be applied to other vocational and technical subject areas, though the composition of course content and minimum requirements for graduation or teaching certificates are slightly different from one university to another.

Some of the teachers of vocational-technical subjects in the upper secondary school are also trained at a teacher education department of the university.

In-service education programmes are organized at three different levels: one is courses organized or sponsored by the Ministry of Education, the second is the courses organized by local (prefectural/municipal) boards of education, and the third level is the courses organized by teacher organizations. Types of in-service courses can be grouped into two types: one is to disseminate principles and directions of newly revised courses of study in vocational and technical education and the other is for professional enrichment of individual teachers. The course contents and duration of each course vary from one course to another and the mode of training is either lecture-based or practical training-oriented including in-plant training.

IV. Problems - Innovations - Issues

1. The number of students obtaining certificates for industrial arts education and vocational and technical education is larger than the number that are employed as teachers.

2. In the preparation of industrial arts, and vocational and technical education teachers, too much emphasis is given on theory rather than the development of practical ability.

3. There is an inadequate time allowance allocated to practice teaching.

4. There is a tendency among new teachers to be strong in some areas and weak in others. In these days, most vocational and technical education teachers have no work experience in either public or private sectors.

5. There is a need to interlink the contents of pre- and in-service programmes.

6. Careful planning is needed to develop programmes of in-service training to meet the career needs of teachers.

7. There is a need to develop in-service training programmes in theory and practice, vocational and technical skills, and in pedagogy.

8. Programmes organized by the Ministry as well as by prefectural boards of education need to be coordinated with in-service programmes conducted by teacher organizations.

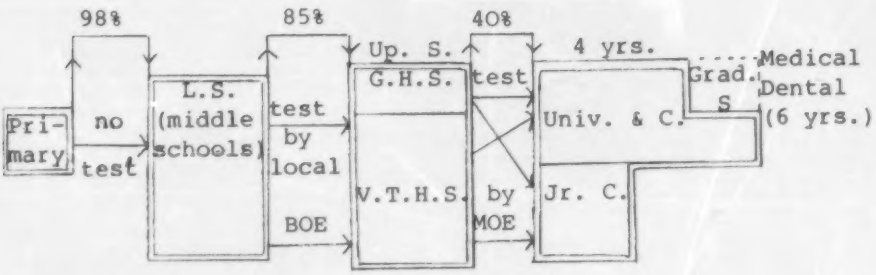
9. Evaluation of in-service training should be undertaken so that the effectiveness of the programmes is ensured.

REPUBLIC OF KOREA

I. The Education System

General education comprises four stages: primary (6 years), lower secondary (3 years), upper secondary (3 years), and higher education.

The high schools offering upper secondary education are generally divided into two categories: academic and vocational. The latter includes technical, agricultural, commercial, fishery and marine high schools. There are comprehensive high schools which incorporate both and academic and vocational courses.



There is also an extended programme of non-formal education. Air and correspondence high schools and colleges were established to provide educational opportunities to the out-of-school youth and adults who are employed. These programmes cover all requirements of formal school/college curriculum.

II. Vocational and Technical Education

All male and female students from grade 5 through grade 10, are required to take pre-vocational/industrial arts/career education subjects as part of general education.

Vocational and technical education preparing youth for the job in the world of work begins at the level of upper secondary schools.

Entrants to vocational and technical high schools come from the lower secondary schools. They are required to take the preliminary examination which is provided by the eleven provincial Boards of Education. This system is designed to screen high school applicants both for academic and vocational high schools. Although the same examination applies to the two streams, the candidates for vocational and technical high schools are screened beforehand. Those who fail in the screening test are given a chance to enter academic high schools on the basis of lottery results. As such, this system is reflective of an attempt to channel more able students into vocational and technical high schools.

There are 97 technical high schools which have about 300,000 students.

Practical, manipulative skills training has been emphasized in the last decade to meet the demand for skilled workers in industries. However, today as industry is growing, more broadbased basic knowledge and skills are emphasized to adapt to the rapidly changing industrial situation.

The technicians are trained at the junior technical colleges (13th - 14th grades).

III. Vocational and Technical Teacher Training

In the Republic of Korea, four major types of programmes for vocational and technical teacher education can be delineated by their curricula:

Type I : Baccalaureate Programmes at University Departments of Industrial Education

Type II : Master Degree Programmes at Graduate Schools of Education and Engineering

Type III : Instructor Training Programmes at the National Central Vocational Training Institute, and

Type IV : In-service Training Programmes under the Supervision of the Ministry of Education.

Type I is the most representative one of programmes for vocational and technical teacher education. University colleges or departments of industrial or agricultural education have as their objectives the basic education and pre-service training which will qualify graduates for teaching in a vocational or technical senior high school, or a middle school. Upon s tisfactory completion of prescribed academic courses in pedagogy and the major teaching field, the graduates are awarded the "Class II" national teacher certificate as well as a bachelor's degree. In addition, the opportunity to obtain the teacher certificate for vocational and technical education is open to the students in non-education engineering majors. The students may choose to pursue the 16-credit pedagogical course leading to the Class II national teacher certificate. If not, they may request the Class III teacher certificate without studying in any pedagogical subjects.

Type II is established to serve the need for high-level preparation for teaching in vocational and technical fields. Upon receiving the bachelor's degree in industrial education, a graduate may take a teaching position and, after acquiring some professional experience, return to the Graduate School of Education or the Graduate School of Engineering for study leading to the master's degree and "Class I" national teacher certification. A student who has never obtained a teaching certificate or whose teaching certificate is Class III may choose to complete the requirements for Class II certification for teaching. In general, it appears that the students who enroll in this Type II programme are pragmatic doers who up-to-date or refresh their knowledge and skills in teaching fields.

While the above-mentioned two types of programmes are initiated by the formal institutions of higher education, the Type III is, in a sense, a teacher training programme organized by a non-formal educational institution. To meet the increasing demand for vocational and technical instructors in industrial plants and non-formal vocational and technical training institutes, the Government established the "National Central Vocational Training Institute" (NCVTI) in 1968. The NCVTI is a tuition-free national educational organization with a single-goal specific vocational and technical teacher training. The Institute awards neither academic degrees nor national teacher

certificates, but does award "instructor" certificates with Class I or II craftsman/engineer certificates. The Institute is post-secondary since the education of the institute presupposes a student body composed of high school graduates or individuals who have by some device achieved equivalent education.

Finally, the Type IV is designed by the Government with the objective to retrain and enhance the vocational and technical education teachers in-service training at middle or vocational/technical senior high schools. This in-service teacher training programme is usually offered by the institutions which initiate the Type I programme, at the Government's request. The graduates of this programme can apply for a higher level teaching certificate after completing appropriate periods of teaching experience.

The course offerings in university colleges or departments of industrial education are composed of three main components: 1) general education, 2) major field education, and 3) pedagogical studies.

In particular, the College of Industrial Education, Chungnam National University, is the only single college in the Republic of Korea completely devoted to vocational and technical teacher education. This college offers eight subject-area specializations, which depend upon the teaching positions for which the students are preparing, as follows.

- Architectual Engineering Education
- Civil Engineering Education
- Chemical Engineering Education
- Electrical Engineering Education
- Electronic Engineering Education
- Mechanical Engineering Education
- Machine Design Engineering Education
- Metallurgical Engineering Education

The percentage of credits devoted to each main division of the curriculum depends entirely on the institutional policy formulation. In a typical vocational and technical teacher education curriculum at universities or colleges,

the percentage would be about 30% general education, 58% major field education, and 12% pedagogical studies. The percentage of time devoted to lab or shop work in major field education is much higher than that (30%) in the curriculum for non-education engineering majors.

The curriculum of Type II at the evening graduate schools puts its emphasis on providing up-to-date training for technical and vocational teachers in schools or plants. To earn a master's degree, a minimum of 30 credit hours are required, which are, in general, distributed into three components: 1) major field (18 credits), 2) pedagogical studies (6 credits), and 3) thesis writing (6 credits).

The programme offerings for instructor training at the NCVTI is more diverse than for other types of vocational and technical teacher training. The NCVTI offers teacher training programmes, some of which are not covered by formal institutions of higher education. The specialty of teacher training courses at the NCVTI is divided into nine courses as follows:

- Foundry and Wood Pattern Making
- General Machine
- General Fitting
- Tool and Die Making
- Sheet Metal and Welding
- Pipe Fitting
- Internal Combustion Engine
- Electric Apparatus
- Industrial Engineering

The percentage of time devoted to each curriculum component is as follows: 1) 7% general education, 2) 82% major field education, and 3) 11% pedagogical studies. In general, the course offerings at the NCVTI is specialized, and the coverage is intensively concentrated, at times pertaining to unusual depth in a narrow field.

Finally, Type IV programme, an in-service teacher retraining programme, places its primary educational objective on improvement of professional knowledge in major fields and

teaching skills of the vocational and technical teachers. The distribution of time into the three main curriculum components would be 15% general education, 70% major field education, and 15% pedagogical studies.

IV. Problems - Innovations - Issues

There is no single curriculum which is best for every vocational and technical teacher education institutions; and in practice, each institution often makes effective use of a combination of curricula models. Perhaps, however, because of their tendency to take a pragmatic rather than academic approach, vocational and technical teacher training institutions may have some concerns in common in their curriculum development. In the pages that follow the three specific issues are briefly outlined.

Firstly curriculum development should have goals and action that originate in a unified sense of purpose within the vocational and technical teacher educators and the consumers. In some institutions or programmes, however, all the activities pertinent to curriculum development or change have become the sole responsibility of the inside producers -- administrators and/or faculty members. There is, consequently, widespread dissatisfaction with the failure of past strategies of curriculum development and change to enlist the collaboration of groups interested in vocational and technical education. It is doubtful that any rational approach guided solely by "experts" and theories will capture more than a limited constituency. In responding to the demands for specific services of the society, there is a need to keep in close enough contact with those outsiders, the consumer groups -- students and their employers -- who would use the products. Flexible accomodation to the needs and demands of students and their perspective employers is the outstanding features of vocational and technical teacher education. One of today's challenges faced by vocational and technical teacher education, in the Republic of Korea, is how to maximize net satisfaction of industry and the students. Tackling this challenge must be a cooperative venture.

Secondly there is concern with the qualitative and quantitative standard for vocational and technical teacher education. There is ample evidence that the demand for

vocational and technical teachers will vastly increase and diversify itself along with the continuity and rapidity of the process of social, economic and technological change taking place in this society. This view leads to a general consensus that the number of institutions for vocational and technical teacher education will increase and their teacher training programmes will be diversified in terms of both breadth and depth. In the Republic of Korea, years ago some people subscribed to the view that vocational and technical subject-matters and their teachers were disreputable and peripheral. This generalization was probably based on poorly prepared vocational and technical teachers. Today, there is almost universal acceptance of vocational and technical teachers as a direct result of improvements in the quality of vocational and technical teacher education. National licensing and stricter rules of practice in teacher education have added to the demise of substandard vocational and technical teachers. While not impossible, however, it is difficult today to apply a single policy standard to each and every diverse type of vocational and technical teacher education. The advent of an internal self-policing activity in the form of voluntary, non-governmental accreditation is desirable so as to establish quantitative and qualitative standards of teacher education in vocational and technical fields, and to affirm its operation.

Thirdly there is the issue about the time or credit distribution in the three major curriculum components in vocational and technical teacher training. In general, in the past curriculum planners and specialists seemed to give more attention on how to distribute the given number of credits or hours into each component. However, it is a false issue that the question of how to distribute time is important. The most important question is what to include in each element. The distribution of time depends upon the quantity and quality of selected and organized content in each element. Curriculum development is especially effective for upgrading and updating content, and curriculum updating is especially important in areas where things happen rapidly. The area of vocational and technical education has seen rapid technological changes, particularly in the world of work, requiring continual updating of materials. There is a growing opinion among the public that technological and socioeconomic conditions demand a change in the basic philosophy and goals of vocational and technical

education. This observation strongly indicates that curriculum development for vocational and technical teacher education must place its emphasis upon continuously changing subject-matter content for improving teachers.

In sum, the above-mentioned three issues concerned with curriculum development for vocational and technical teacher education can be restated into three questions as follows. These questions should be tackled in the future for the betterment of vocational and technical teacher education.

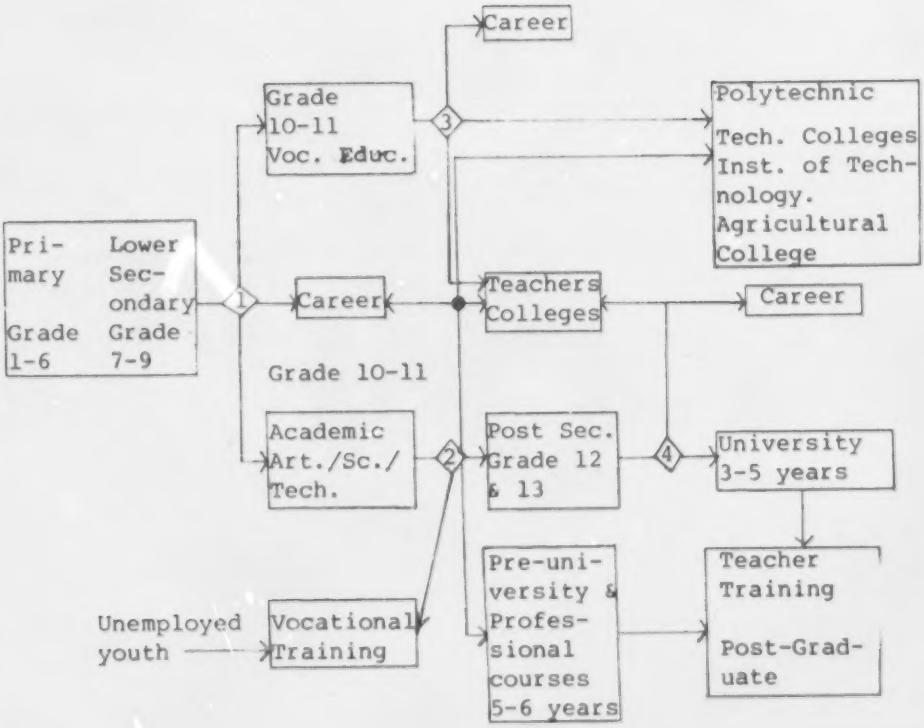
1. Who should be involved in curriculum development for vocational and technical teacher education?;

2. What standards should be established for the maintenance of minimum quality and practice in vocational and technical teacher education?; and

3. What should be included in the learning content and experiences for vocational and technical teachers?

MALAYSIA

I. The Education System



Note:

1. Lower Certificate of Education Examination
2. Malaysia Certificate of Education (O Level) Examination
3. Malaysia Vocational Certificate of Education Examination
4. Higher School Certificate of Education Examination. (A level)

1. Lower Secondary Schools

In Malaysia students follow a general and liberal comprehensive educational system. All students are required to study at least one of the four practical art subjects, i.e. Industrial Arts, Agricultural Science, Home Science and Commercial Studies.

2. Upper Secondary Schools

Successful lower secondary students enter the general secondary schools or the secondary vocational schools. In the general secondary schools, the students are streamed into science, technical or arts classes based on their lower certificate examination results. The general secondary schools are academically-oriented, whereas the secondary vocational schools are occupational-oriented.

Students who do well in the Malaysia Certificate of Education are given the chance to follow pre-university classes or join one of the polytechnic, technical, agricultural colleges or institute of technology. For those from the vocational stream only the best few are selected to join the polytechnic, technical, agricultural colleges or institute of technology.

II. Vocational and Technical Education

Other than those vocational courses offered at the secondary vocational school, all vocational courses and technical education are provided at post-secondary school level.

There are many agencies that provide vocational and technical education at various levels and scales. Anyhow the four main agencies are as follows:

1. The Ministry of Education takes charge of polytechnics, technical colleges, agricultural colleges and the technical teachers training college.

2. The Ministry of National and Rural Development takes charge of the Majilis Amanah Pakyat (MARA) Institute of technology and the MARA vocational institutes.

3. The Ministry of Culture, Youth and Sports runs the Youth Vocational Training Centres.

4. The Ministry of Labour runs the Industrial Training Institutes.

There are also few private institutions that provide vocational and technical training.

All vocational courses are conducted at certificate level. Usually the courses are for a duration of two years or less. For the technician level the courses are for a duration of three years and the graduates are awarded diplomas.

III. Vocational and Technical Teacher Training

There are only few colleges in Malaysia that offer courses up to technician level. The number of courses are limited in areas. As such the number of teaching personnel is small. It is not feasible yet to have a technical teachers training institute to train all the teaching personnel. At present most of the teaching staff are fresh graduates with little industrial experience. They are employed first and later given an in-service teacher training locally or overseas for a period of one year. Those sent overseas are most likely to follow technical teacher training programmes. Those trained locally will follow the general teacher training programme. Although this is not the best way some form of training is better than nothing.

The vocational teachers training is more established. The training is provided by the Ministry of Education, Teacher Training Division, at the Technical Teachers Training College. It is a three-year programme. All trainees are taught eight core subjects and a technical subject (elective). The core subjects include languages, education, educational technology, moral/religious education, physical education and music. About 50% of the total time is spent on the technical subjects. Out of this 40% is for theory and 60% for practical. The trainees undergo seventeen weeks of industrial training and fourteen weeks of practical teaching.

The trainees are selected from those who have passed the

secondary vocational certificate of education examination with a good grade or the Malaysia Certificate of Education examination in addition to having industrial experience. Although the selection committee try to select those with good industrial experience, the number is small.

To supplement the training programmes, the government still sends academically qualified candidates with many years of industrial experience overseas for vocational teacher training. This is one of the ways to attract personnel from the industry to take up teaching.

Staff development is always an important aspect in vocational and technical teacher training. In order to keep abreast with technological development, programmes are being organized at all times. The programmes include sending personnel for higher studies, skill upgrading, professional retraining, study tours, seminars and industrial attachments.

IV. Problems and Issues

1. There is lack of consultation and co-operation among the various agencies providing vocational and technical training. There is the need to co-ordinate all vocational and technical training.

2. There is no standardisation and accreditation body for vocational and technical training. The time has come to set up such a body to control and regulate all forms of training at national level.

3. Vocational and technical training provided is not in line with the manpower requirements.

4. The quality of teachers is inferior due to faulty selection of candidates, ineffective teaching and inadequate facilities.

5. Due to conditions of service, it is difficult to attract skilled people with long industrial experience to join the teaching profession.

6. There is a high number of competent vocational and technical teachers leaving the teaching profession for industry.

7. Opportunities for non-graduate teachers to improve their educational and professional qualifications are limited.

Some Innovations include:

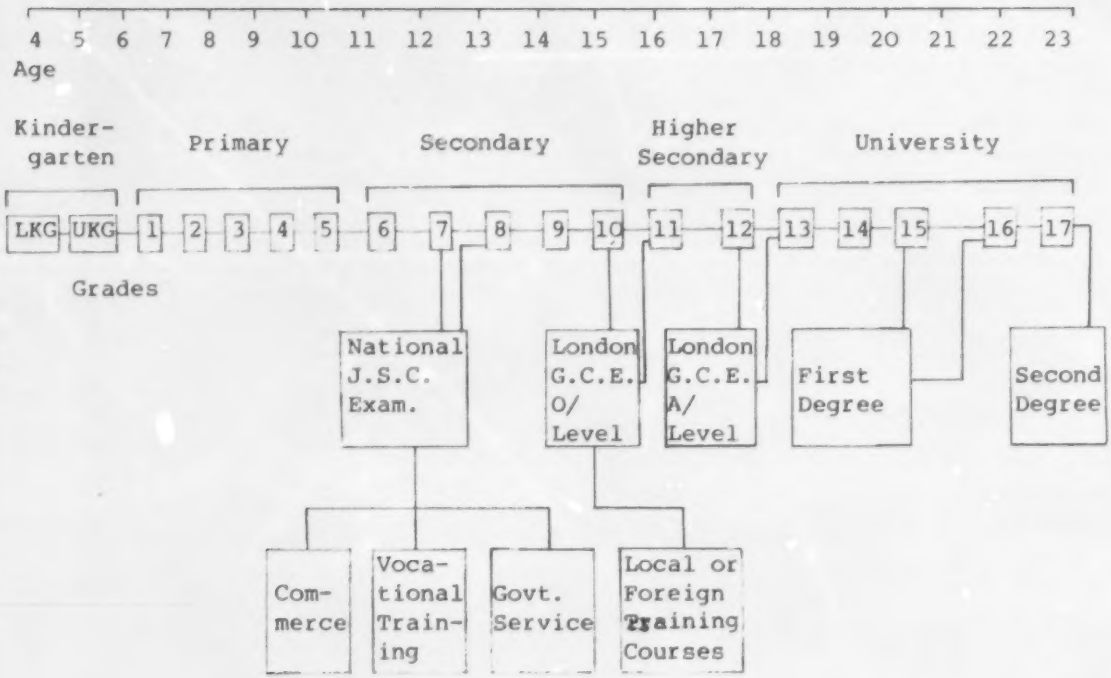
1. As of the 1982 intake, candidates for teacher training have to pass an aptitude test before being called for interview.

2. Vocational teachers are given two increments higher in starting pay compared to general academic teachers. There is the allocation of more funds for vocational and technical education to enable institutions to obtain better machinery and instruments with the aim of improving quality of training.

3. There is provision for more scholarships for higher studies. More teachers are being given opportunities for in-service courses, seminars, study tour and skill upgrading.

4. Those who obtain scholarships from the government are bonded to join the teaching profession.

I. The General Education System



At present there is no single unified general education for the country. The present educational institutions include the "Kiyavange", Maktab, Madrasaa, Atoll schools, the Atoll Education Centers and the English Medium Schools in Male.

I. Primary education in the Atolls

"Kiyavange" This is an informal neighbourhood/pre-primary school. Children between ages of 3-7 attend a neighbourhood home to be instructed in Divehi, Arabic script, and numerals. The basic function of this institution is to teach basic literacy, numeracy and the reading of the Quran.

2. Island Schools ("Maktab"/ "Madrasaa")

The main difference between the Maktab and the Madrasaa is their size and curriculum content. The Madrasaa enroll more students and have a wider curriculum. Both schools are formal in nature and take children above three years of age. More recently a revised educational structure has been introduced which requires all Madrasaas to teach a new primary school curriculum (five grades) starting at the age of six. The new curriculum now being introduced in all primary schools consists of nine subjects: Environmental Studies, Islam, Divehi Language, English, Mathematics, Fine Arts, Physical Education, Quran, and Handwriting. The medium of instruction is Divehi.

3. Atoll Schools

In 1979 Government established one Atoll School in each of the 19 Atolls. These are entirely financed by the Government. These schools are similar to the Madrasaas discussed above. These schools although intended to serve the entire Atoll, currently serve the island population on which they are located, and can thus be considered regular island schools.

4. Atoll Educational Centers

Atoll Education Centers (AEC) are being established in each of the 19 Atolls. The AEC's presently serve as "model" primary schools where the newly introduced curriculum content is being taught by trained teachers.

5. *Primary and Secondary Education in Male*

While all instruction in schools in the Atolls is given in Divehi, in Male, since 1961, English as a medium of instruction has been introduced to schools from pre-primary to higher secondary levels.

There is one pre-primary school in Male which enrolls all applicants of four years of age. This school is fully financed by the state.

There are two state run English medium primary/secondary schools: Ameeniyya School for the girls, (enrolment 1,152 in 1981) and Majeediyya School for boys (1,335 in 1981). In addition there is an additional primary/secondary school partly subsidized by the Government. There are also many smaller schools and Madrasaas some of which provide education up to grade 7.

6. *Higher Secondary Education*

The Science Education Center (SEC) in Male is the only institution providing pre-university education to graduates from lower secondary schools. Current enrolment is 48 and the medium of instruction is English.

7. *Post Secondary Education*

All post secondary education is provided abroad through multilateral or bilateral scholarship schemes. Currently the country does not have any educational institution at this level.

8. *Other Education and Training Institutions*

In addition to the schools discussed above, there are a number of other institutions which provide education and training.

8.1 The Ministry of Home Affairs jointly with Maldives Shipping Limited is operating a reformatory school on the island of Maafushi in Male Atoll for juvenile delinquents.

8.2 The Islamic Studies Institute in Male under the

Ministry of Education provides instruction in Arabic and specialises in Islamic Studies.

8.3 Allied Health Services Training Center under the Ministry of Health trains Health Assistants, Family Health Workers, midwifes and other health personnel.

8.4 The Educational Development Center (EDC) under the Ministry of Education is the only teacher training institute in the country. EDC trains primary school teachers both in English and Divehi medium.

9. Non-formal Education

9.1 A carefully planned literacy programme is underway which aims at eradicating illiteracy by 1986.

9.2 A series of educational radio programmes are provided in different areas as non-formal means of education.

II. Vocational and Technical Education

1. Vocational Education

The Vocational Training Center (VTC) in Male was established as a first step in the process of diversification of Lower Secondary Education. The center provides two-year apprenticeship training in: (a) Electrical Repair and Maintenance, (b) Diesel and Petrol Engine Repair and Maintenance, (c) Welding and Sheetmetal work, (d) Machining. New trades to be added from 1982 are Refrigeration and Airconditioning, Electronics and Building Construction.

Rural Youth Vocational Training Centers are to be introduced to the Atolls as a form of lower secondary education at the earliest possible date.

Pre-vocational training is to be introduced into the normal curriculum of lower secondary schools with the aim of broadening the pupils perception of occupational roles and abilities.

In due course higher secondary vocational training centers are to be established to meet the country's needs

of skilled manpower.

2. Technical Education

There are no institutions providing technical education at any level in the country. The country is totally dependent on overseas training programmes for technician training.

III. Vocational and Technical Teacher Training

There are no such facilities available locally. For staffing needs the country is compelled to depend totally on training abroad through multilateral, bilateral or government scholarships.

IV. Problems - Innovation - Issues

Problems and issues

1. An accute shortage of trained teachers at all levels and areas, particularly in vocational and technical field.

2. In the case of vocational training, the lack of suitable trainees to vocational courses.

3. The non-existance of technical institutions.

4. A need for foreign and international aid in the realisation of educational goals.

5. Shortages of text-books, funds and teaching aids.

6. The limited output of graduates at the secondary level of education.

7. The financial burden of maintaining foreign staff.

Innovations

1. Education is given top priority among development goals.

2. The establishment of educational goals such as:-

- Universalisation of primary education by 1990.

- Eradication of illiteracy by 1986.

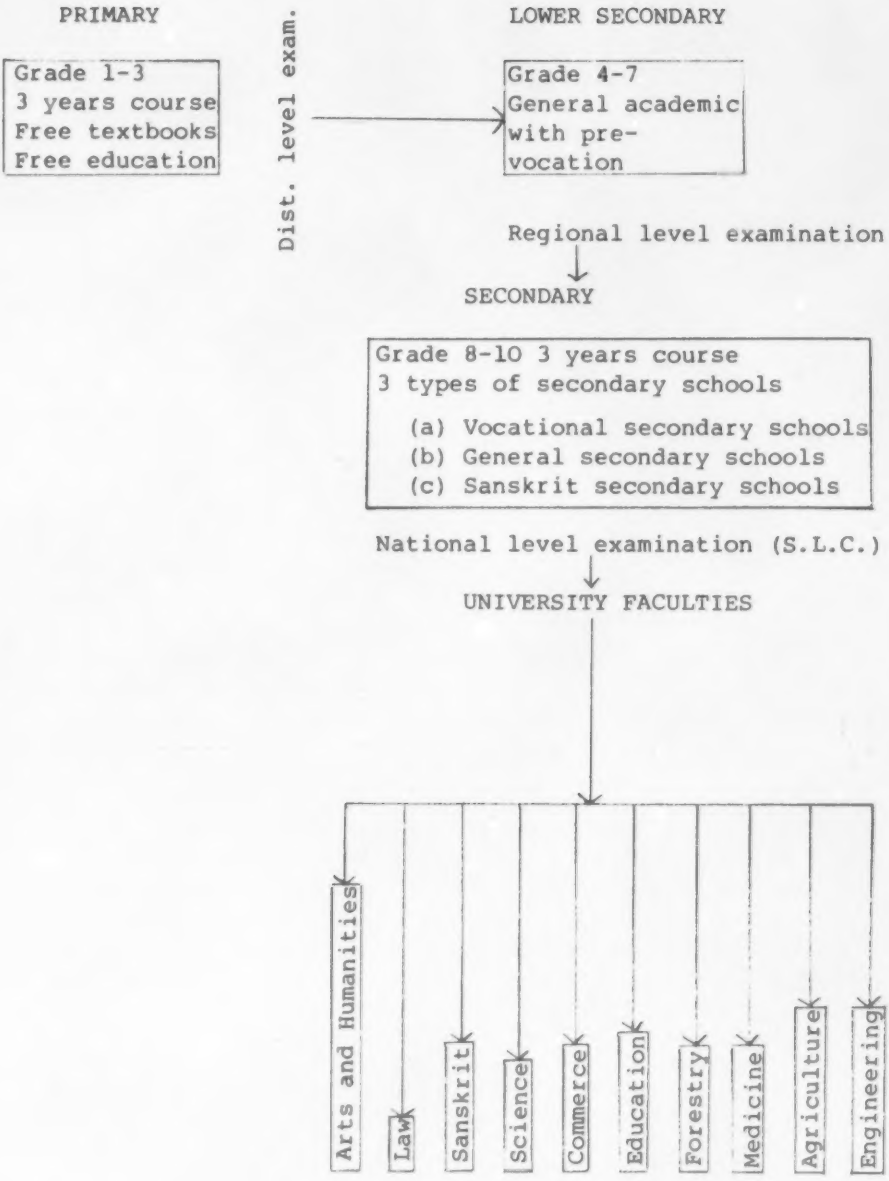
- Committment to providing of equal opportunity in education to all citizens regardless of their geographical location, etc.

3. The initiation of a number of new projects to overcome current shortcoming, e.g. EDC, VTC, AEC etc.

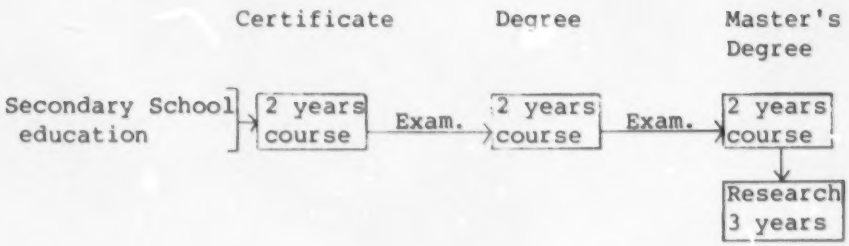
4. Increases of budget allocations to education in relation to other areas.

NEPAL

I. The Education System



Levels in higher education



Up to the lower secondary level, Nepal has the same type of education all over the Country. In relation to the primary education and lower secondary education a decision of extending primary education up to grade 5 and keeping grade 6 and 7 as lower secondary have been made.

II. Vocational and Technical Education

1. Secondary Schools

A general academic course with vocational subjects is taught at this level up to three years. In the curricula of general secondary school a twenty per cent time allocation is given for vocational subjects such as: Animal Husbandry, Poultry, Horticulture, Trade and Industry, Secretarial Studies, and Science. The allocation is forty per cent in vocational secondary schools.

Integration of skills training programmes with general education resulted in poor vocational skills among students so that they were not able to take skilled worker's positions although there is a need for such skilled manpower in the country. At the same time the nation could not afford to supply the necessary teaching materials, trained and skilled teachers to all the secondary schools all over the country. After a careful evaluation of the vocationalisation of secondary education it was decided that the school hours allocated to vocational subjects should be reduced to ten per cent in all secondary schools and to establish trade/technical schools, in different parts of the country, offering different trades useful and relevent to area development activities. The trainees will be trained in a real work

situation so that they can be employed locally. Within the current 6th year plan vocational schools will be gradually replaced by trade/technical schools.

2. *Technical/Trade Schools*

There will be two types of technical/trade schools

- Lower secondary level technical schools
- Secondary level technical schools

2.1 Lower secondary level technical schools:-

Students over 13 years who have minimum educational qualification of grade 5 will receive training of two years. They will get some practical job experiences from user agencies on apprenticeship

2.2 Secondary level technical schools:-

Students over 15 years with a basic educational qualification of grade 7 will receive a training of three years in these schools supplemented with one year of job training (on apprenticeship). Out of 14 proposed technical schools three of them are already in operation and four of them are under construction.

3. *Higher Education*

Matriculating students may enter colleges of advanced education for two years study, and are awarded certificates. A degree will be awarded after two years additional study. For the master's degree another two years is required and for higher studies directed towards research another three years is required.

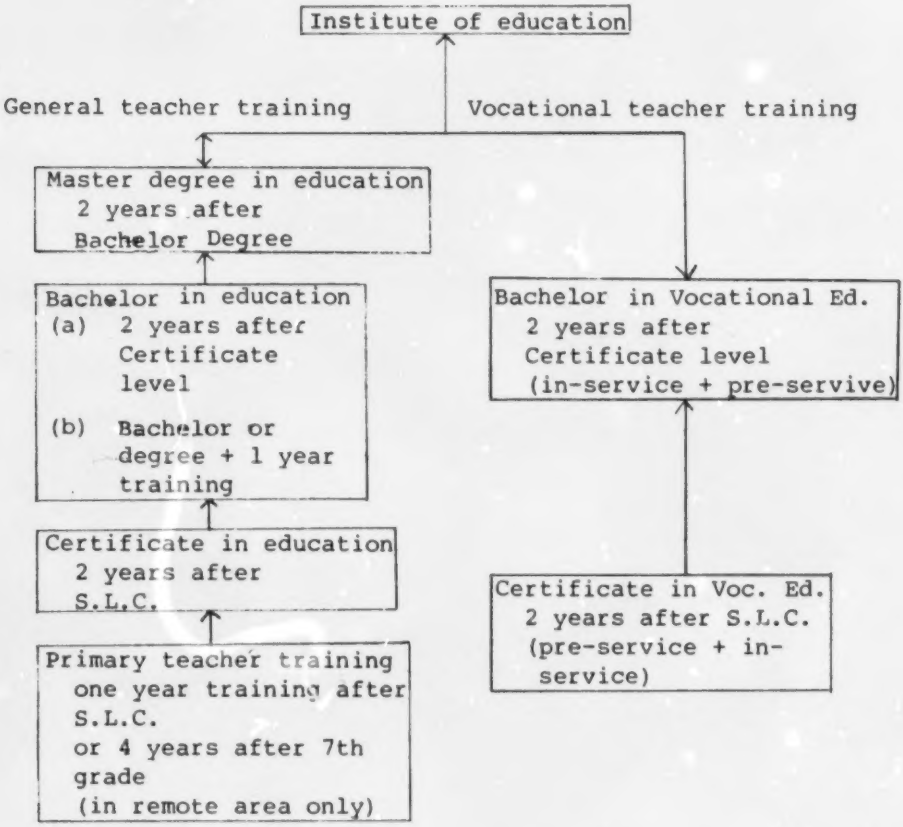
4. *Technical Education*

There are different types of institutes under the university offering technical education in such fields as agriculture, polytechnic engineering, forestry and medicine. These institutes provide education up to degree and diploma

level.

III. Vocational and Technical Teacher Training

All the teacher training programmes are conducted by the Institute of Education



1. Lower Secondary Pre-vocational Teacher Training

To become a qualified pre-vocational teacher one should have training for two years after passing School Learning Certificate (S.L.C.) examination. This training programme includes theoretical studies and practical experiences in prevocational subjects like bamboo-work,

kitchen gardening, and food preparation. Also included are, pedagogical training and academic education.

2. Secondary Vocational Teacher Training

Those who have passed certificate level examinations or prevocational teacher training are given two years training in one of the vocational subjects such as horticulture, agronomy, poultry, animal husbandry, furniture-making, home science, or electric fitting. The training includes theoretical knowledge, some practical experiences, and pedagogical study in the vocational subjects chosen by the trainees. Successful trainees will graduate Bachelor in Vocational Education and will be qualified for secondary vocational teaching.

3. Training for technician teachers

There is no programme for training technician teachers within the country. The teachers for technical institutes are sent abroad or to India for training and higher education.

IV. Problem - Innovations - Issues

Problems

1. The shortages of trained trade/technical teachers for technical schools and technical institutes.

2. The shortage of teacher trainers.

3. The shortages of subject teachers.

4. The in-adequate supplies of teaching aids both in "soft ware" and "hard ware".

5. The trend for students to favour higher education rather than vocational education.

Innovations and Issues

1. A technical teacher training campus is to be established in the near future.

2. Teaching should be made attractive enough to compete with other careers.

3. Providing more practical experience, developing technical skills, and promoting positive work attitudes as basic ingredients in training programmes for technical teachers.

NEW ZEALAND

I. The Education System

1. Technical and vocational education is an important part of a centrally controlled general education.

2. All children must attend school from the age of six (although the majority start at age five) until they are fifteen years old.

3. Following six years of primary schooling, most children in towns and cities attend an intermediate school when they are eleven and almost all children continue on to secondary school at about the age of thirteen.

4. Most students finish their secondary education at sixteen although some continue for another year or two to gain more academic qualifications. Such awards allow them to be accepted for university and teachers college courses or to gain jobs which demand higher entry qualifications. About twenty per cent of school leavers go on to some form of further full-time education or training at technical institutes, universities or teachers colleges.

5. General education is:

- Six years primary schooling,
- Two years intermediate schooling,
- Two-five years secondary schooling,

prior to employment or continuation of education at the tertiary level.

II. Vocational and Technical Education

1. Since 1960, when new policies were introduced, there has been a rapid growth of technical institutes and community colleges. The old technical high schools became part of the comprehensive secondary system and technical and vocational education, in the main, became a tertiary level enterprise.

2. Technical institutes and community colleges (21)

provide the greatest range of occupational courses and adult educational opportunities particularly for middle-level technical manpower and skilled and semi-skilled workers with about 6,000 full-time students, and about 130,000 part-time students.

3. There is one national institute (The Central Institute of Technology) providing national courses which because of their specialist nature, the cost, and the limited number of students are not viable at the local institutes.

4. The Technical Correspondence Institute with its 29,000 students provides the opportunity for students unable to attend local institutes for work or personal reasons to continue their studies.

5. The seven universities are also vocationally oriented and each has its own range of specialist schools in such fields as engineering, law, medicine, commerce, agriculture, architecture and forestry.

6. There is a national committee which monitors courses at the tertiary level, thus ensuring that unnecessary duplication of courses, particularly between technical institutes and universities is avoided.

7. The Vocational Training Council set up by Government in 1970 now has industry training boards which link the manpower needs of industry and commerce to training programmes. There is a close association between the boards and the technical education system in which many programmes are provided in co-operation with the boards.

8. Technical institutes and community colleges have their own councils (or governing authorities) comprising representatives from the community such as trade unions, employers, women, professional associations, teachers and allied staff groups. The institutes receive all their finance from government and are very much part of the centrally controlled education system. Efforts are currently being made to seek greater automony in some financial areas and in the provision of courses.

9. It could also be noted that the technical education system is at present playing an important role in assisting Young Persons Training Programmes (YPTP) at a time of high

unemployment in New Zealand.

III. Vocational and Technical Teacher Training

1. Most teachers in technical institutes and community colleges (total: about 2,000) are recruited after they have had a number of years practical experience related to their special subject areas.

2. Most new tutors have received no training as teachers prior to appointment. Each is given a short induction programme within his own institution of one to three or four weeks and his teaching duties for the first year are reduced to 90 per cent of a full work load.

3. In June 1972 the government approved a scheme for the training of technical institute tutors and authorised the establishment at the Central Institute of Technology, Wellington, of the Tutor Training Unit (T.T.U.) to conduct courses in tutor training. In 1981 three regional centers in Auckland, Wellington and Christchurch were established to supplement the work of the T.T.U.

4. The training course of twelve weeks is divided into four blocks with intervening periods of teaching in the home institute. The blocks are:

- an initial one of two weeks designed for tutors who have had little or no teaching experience. The course is conducted in the regional centers three times a year with the aim of introducing tutors to teaching tasks and the education system;

- block one of four weeks at the T.T.U. which aims to develop basic skills in the teaching/learning process for tutors;

- a "special methods" two week block conducted in the regional centers with the aim of enhancing the tutor's skills in teaching specialised subjects; and

- block two of four weeks at the T.T.U. which further advances knowledge and skills required in teaching.

5. In addition to the basic training at the T.T.U. and associated regional centers tutors may develop their professional expertise through voluntary in-service programmes in the following ways:

5.1 Many technical institutes have on-going staff education and development programmes. Specialist tutors have been appointed in some institutes to establish teaching/learning resource centres and provide in-service programmes.

5.2 The Department of Education provides a number of programmes and conferences for tutors each year. These may be residential if conducted in the one in-service center in Auckland or may be arranged throughout the country at places where tutors meet daily. Such programmes aim to review the curricula, introduce new subjects, or introduce tutors to practices in educational administration.

5.3 The Advanced Studies for Teachers Unit (A.S.T.U.) established in the national correspondence school provides distance-learning education through correspondence for people who wish to improve their teaching proficiency. There is a wide range of courses available including:

- The Adult Learner

- The Adult Learning Experience

- The Adult Teaching and Learning Process

5.4 A national committee arranges vacation courses for teachers. These courses are known as refresher courses and are for teachers from a range of levels including technical institutes.

5.5 Each tutor may take twelve weeks industrial refresher leave after five years service and then another similar period after ten more years service.

5.6 The department also administers an innovative teaching project scheme which provides funds to

promote teaching innovations and the publication of project reports.

6. New Zealand has concentrated upon basic training programmes for tutors new to technical institutes with the exception that those who are trained and hold certificates for teaching in the general education system are not obliged to attend any training in the teaching of adults. Many tutors take part in the in-service programmes described above but face difficulty in maintaining continuity in attending programmes in their own institutes. Consideration is being given to the establishment of a programme leading to the award of a trained tutor's certificate which would be equivalent to certificates awarded at other levels. The ways in which it would be organised and taught have not been determined but it is likely it would reach the majority of tutors through national and regional block courses supplemented by distance learning and self-instructional packages. Some elements may be associated with the A.S.T.U., the teachers colleges, and the universities.

IV. Problems, Issues and Innovations

A. Problems, Issues

1. The lack of long term teacher training programmes for vocational and technical tutors and other teachers in tertiary institutions.

2. The inability of the present training provisions for vocational and technical teachers to allow for the training of tutors appointed prior to 1972.

3. The lack of resources available for the provision of adequate facilities for teaching/learning centres in each institute.

4. The inability of the tutors to take advantage of the institute-based staff education and development programmes because of the required teaching load and other duties.

5. The difficulties in providing training programmes for the large numbers of specialist part-time tutors who are recruited to teach for a few hours each week, mainly in the

evenings.

6. The scarcity of teacher-training for vocational and technical teachers, with adequate relevant industrial experience and relevant teaching experience, and possessing appropriate pedagogical qualifications.

7. The difficulties in providing viable training programmes for the vocational and technical teachers who live in smaller centres of population remote from the existing training institutions.

B. Innovations

While the present emphasis is upon the initial and basic preparation of tutors the continuing education programmes and development of more intensive in-service programmes are being advanced by means of:

1. A greater allocation of resources for the development of institute-based and regional training centres.

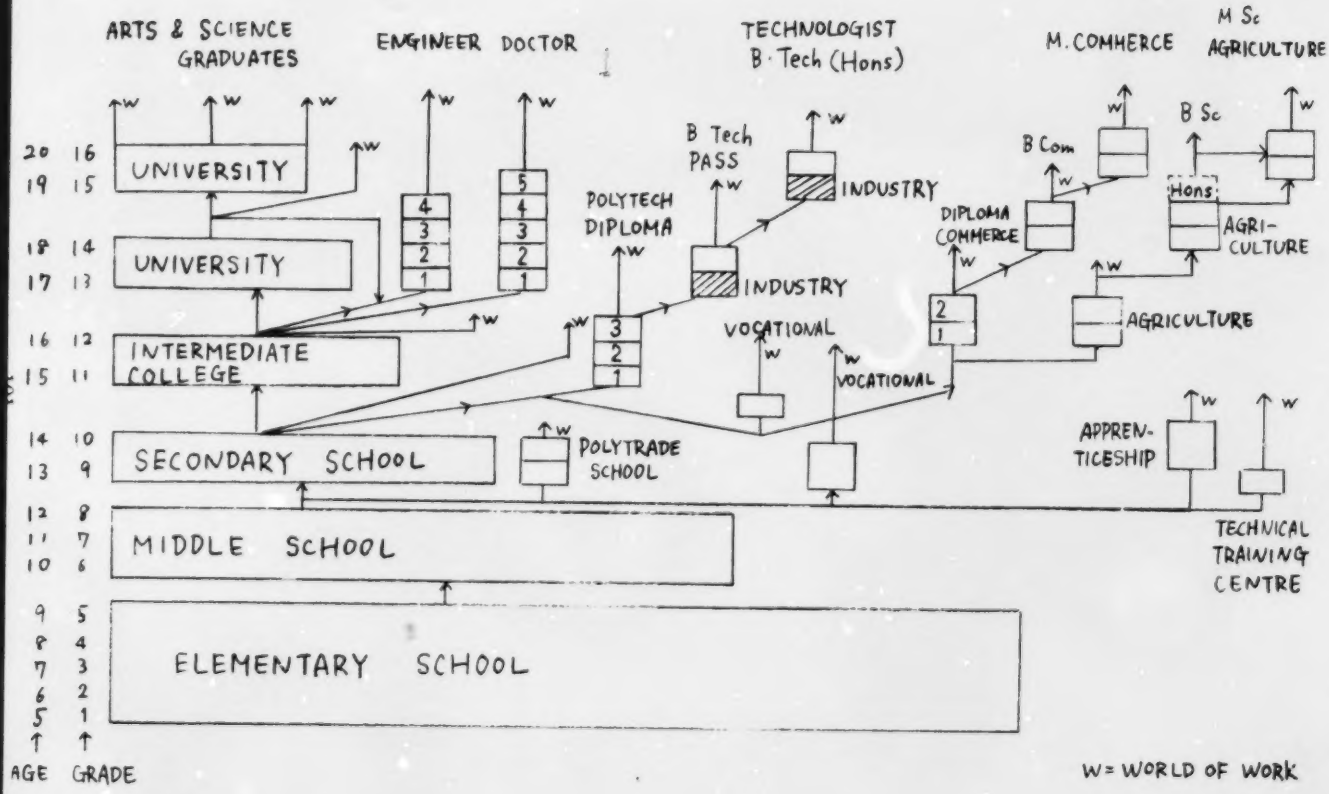
2. Appointments of specialist tutors, in larger institutes to provide continuing education for vocational and technical teachers and to develop teaching/learning centers.

3. Developments in distance-learning training programmes by means of correspondence courses supplemented by vacation block-courses, and

4. The planning towards the development of a trained teachers' certificate programmes for vocational and technical teachers.

PAKISTAN

I. The General Education System



The development of human resources, among other things, depends on the educational system of a country, and there can be no consistent economic growth without human resource development. The need to develop articulation between the manpower needs of the economy and the educational system has become increasingly urgent in recent years.

II. Vocational and Technical Education

Technical education in its present form started in Pakistan about twenty five years ago when Polytechnic Institutes were established in 1955. During this period, technical and vocational education went through many changes in its' content and size. The experiences with regard to changes are very valuable for planning a sound system of education in any developing country.

The field of vocational and technical education in Pakistan includes: (1) Industrial Arts in grades VI - VIII; (2) Vocational subjects in grades IX - X; (3) Industrial technician education offered in Polytechnics and technical colleges to train technicians and supervisory personnel; (4) Vocational education for boys and girls for the preparation of skilled workers; and (5) Commercial education which serves the needs of the distributive sector of the economy, retailing and business organisation. The curricula for grades VI - VIII impart the skill in the field of Agriculture, Industrial Arts and Home Economics. The curricula for Polytechnics, Vocational and Commercial Institutions are production-oriented.

In addition, there are several technical training centers, crash training programmes and apprenticeship programmes in industries working outside the formal vocational and technical education.

The entrants into the vocational and technical institutions are drawn from the general education, as indicated in the diagram.

Quantitative aspects of technical and vocational education are given in the table below:-

Type		No. of Institutions	Output Target 1982-83
B. Tech. (Grad. Technicians)		4	390
Polytechnics (Technicians)		26	5,000
Vocational (Skilled Workers)	(Male)	24	2,700
	(Female)	28	2,500
Commercial	- do -	48	2,500

III. Vocational and Technical Teacher Training

The Agrotechnical, Vocational and Technical Teacher Education programme plays the most vital role in transfering the spirit of changes into actual reality. For agrotechnical and vocational subject teachers, the government of Pakistan has established six Agrotechnical Teacher Training Centres. These centres cover the re-training and short courses for the whole of Pakistan. In these centers in-service teachers are being trained.

Agrotechnical Teacher Training

The purpose of Agrotechnical Teacher Training is to provide teachers with qualifications which are both educational, technical and practical in character. The curriculum of Agrotechnical Teacher Training is applicable to both pre-service and in-service programmes. It is divided into 3 sections:

Section 1 Industrial Arts the objective is to train teachers in multiple activities including woodwork, metal work and applied electricity.

Section 2 Agriculture the objective is to train teachers in multiple activities including Agriculture and Horticulature, Animals and Birds, Insects and Bees.

Section 3 Home Economics the objective is to train teachers in multiple activities including food preparation, clothing, family health

and family living.

The course content and time allocation of agrotechnical teacher training programme regarding Industrial Arts/Agriculture/Home Economics are given below:

	Subjects	* Periods per week
1.	Objectives of Agrotechnical Education and Principles of Education	2
2.	Occupational analysis applied to Industrial Arts/Agriculture/Home Economics	2
3.	Shop/Farm/Home Economics Management	2
4.	Shop/Farm/Home Economics School Planning	2
5.	Teaching methods applied to Industrial Art/Agriculture/Home Economics	3
6.	Audio-Visual Aids	3
7.	Technical Drawing/Teaching of Agri./ Technology of Home Economics	4
8.	Workshop/Agriculture Laboratory/Home Economics Laboratory Practice	18
9.	Teaching Practice	4
	Total	40

* Each period is of 50 minutes duration

Technical Teacher Training

The Technical Teacher Training programme is provided by the technical teacher training wings/centers (T.T.T.C.) in respective provinces with a one year full-time course. It comprises four distinct terms, each of 12 weeks duration. These terms respectively deal with pedagogy, teaching practice,

skill development in scientific areas of teaching methodology in respective major subjects of trainees, and practice in industry or commerce. Courses of short duration are also conducted in specific educational techniques. The award of this T.T.T.C. is Diploma in technical teacher training. The course content and credit hours are given below:-

Professional Courses	18 Credit hours		
	T	P	C
Philosophy of Technical Education	2	0	2
Course planning	1	3	2
Methods of teaching tech. education	2	0	2
Preparation of Instructional material	1	2	2
Testing and grading	2	0	2
Shop organisational planning	1	2	2
Practice teaching I	1	4	3
Practice teaching II	1	4	3

Technical Courses	12 Credit hours
Shop courses are selected based on the recommendations of the Advisors	

General Education			
Educational Psychology	2	0	2
Occupational guidance and Councelling	2	0	2
Organisation of student activities	2	0	2

Elective technical shop courses	12 Credit hours

The concerned teacher will select 12 credit hours of shop work either in his major field or some allied area. This additional technical training will increase the perspective teacher's technical skill as well as help him acquire more advanced manipulative capabilities on modern equipment.

IV. Problems - Innovations - Issues

The critical problems faced are the shortage of technical teachers, their sub-standard industrial and teaching skills, the inadequacy of physical training facilities in the teacher training centers, the difficulties in calling the teachers for in-service training in view of the already existing shortages in the institutions, and the lack of appreciation of professional growth and motivation caused by much better, attractive conditions outside their own educational system.

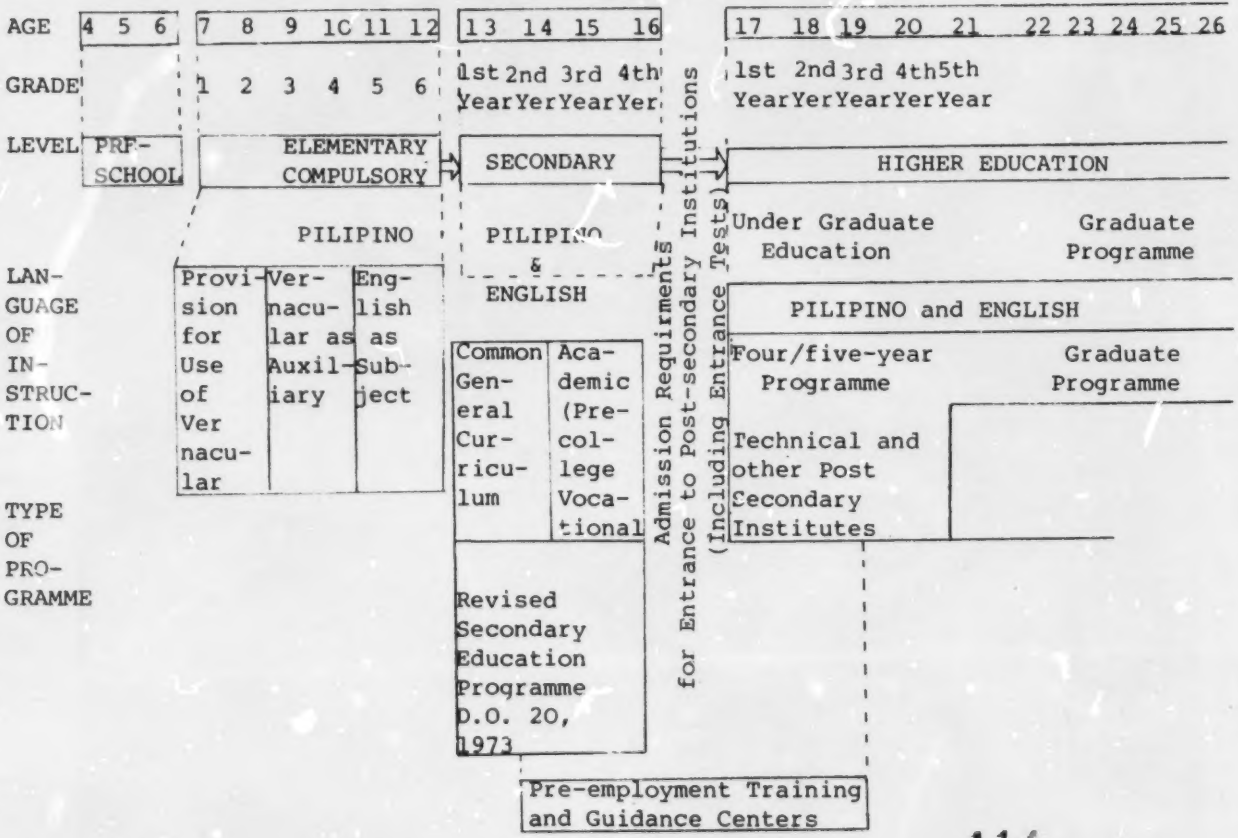
Due to high earnings, up to ten times their home salaries, in the oil-rich Gulf States and Middle East countries, there has almost been a "manpower drain" from the country in general, and from the institutional staff in particular, thus making the problems more acute in nature. The salary-structure in industries is also three times higher than in education. These issues have a direct bearing on the preparation of teachers, the quality of instruction and the standards of outputs.

As a result of the planning and implementation of various government schemes there exists a reasonable infrastructure of technical education, but somehow there has been a feeling that the system has not produced the desired qualitative results.

The critical elements and processes within the technical and vocational education are: (1) the educational structure; (2) the place of technical and vocational education in the overall national educational system; (3) the professional and emotional satisfaction of the training staff; (4) teacher-training and faculty development; (5) the relationship of educational growth to industrial growth; (6) the teaching methods and materials and students evaluation; and (7) educational research and innovation.

Only a scientific and realistic approach to these issues shall enable Pakistan to overcome the shortcomings of the existing system.

FIGURE 1
EDUCATIONAL STRUCTURE OF THE PHILIPPINES



1. The Ministry of Education, Culture and Sports (M.E.C.) has direct supervision of all state schools and non-chartered state colleges including the licencing and control of private schools within the policy framework set by the National Board of Education. While the chartered state colleges and universities are independent of M.E.C., they operate through Board of Regents Trustees chaired by the M.E.C. Minister and abide by the policies set forth by the National Board of Education. Under the M.E.C. are three bureaus for implementing educational policies in elementary, secondary, and tertiary education. (See note 1) Administration and supervision of all schools are decentralised through 13 Regional M.E.C. offices spread over the country.

2. The educational structure consists of six years elementary, four years secondary, and post secondary education of two to five years (tertiary). Secondary education is offered in vocational high schools as preparation for a vocation, or in general high schools as preparation for tertiary level courses.

II. Vocational and Technical Education

1. As an approach toward accelerated manpower training and development, vocational and technical education became a priority concern in educational planning.

2. The 330 public vocational schools, 42 chartered state colleges and universities, and 223 private vocational technical schools offer programmes in various fields and at different levels ranging from training in basic manual skills to professional degree courses.

2.1 Non-formal education

The Office of Non-formal Education of M.E.C. and other government agencies as the National Manpower and Youth Council (NMYC), National Cottage Industry Authority (NACIDA), the Ministry of Labour (M.O.L.), and the Kabataang Barangay (K.B.), conduct short-term non-formal programmes designed for youth and adults to acquire employable manual skills: in the context of regional needs and opportunities.

2.2 Secondary Level

Vocational education at this level prepares students for occupations in the artisan and craftsman levels, in a specific trade or vocation. The programmes are in such fields as agriculture, fisheries, industrial arts, business and commercial arts, and home economics which are offered in specialised vocational high schools and in secondary departments of some colleges and universities, both public and private. In the private sector the courses tend to concentrate on business and commerce, beauty and fashion, and vary from three months to two years, as they are terminal courses.

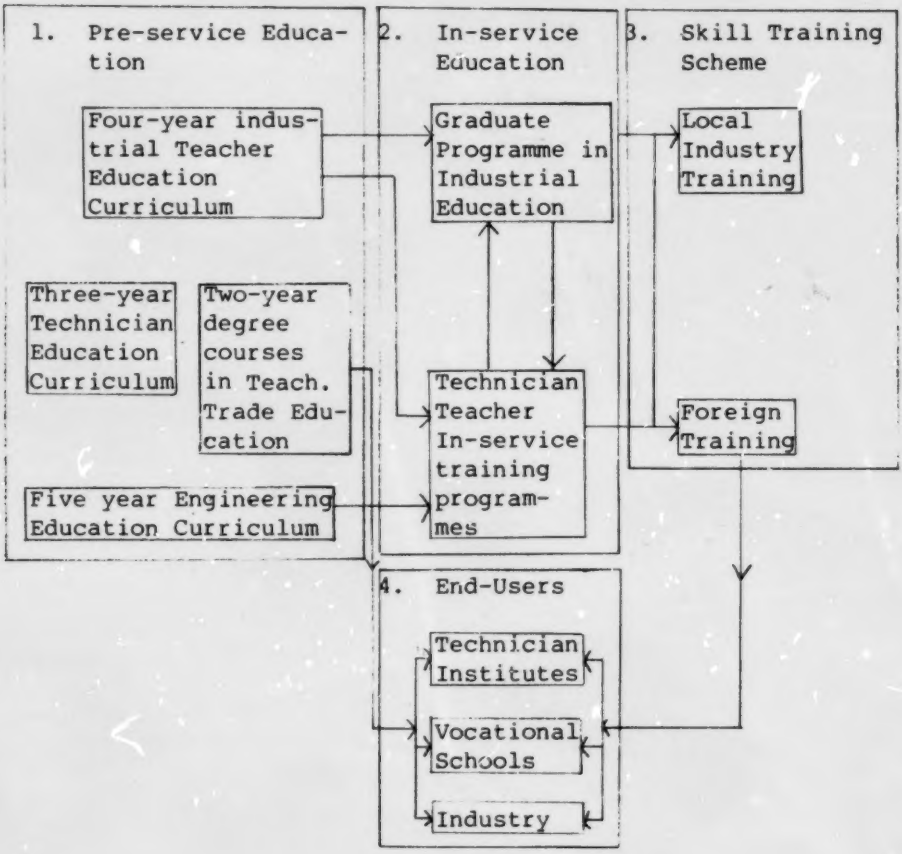
2.3 Post-secondary or tertiary level

Two years post secondary certificate programmes are offered in schools of arts and trades, colleges of arts and trades, and in state colleges and universities. These are at the lower technician level and promote skills training in: a) automotive; b) building construction; c) electrical; d) electronics e) mechanical; f) refrigeration and air conditioning; g) welding and fabrication, and h) wood working. (See note 2) Three year post secondary diploma programmes at the higher technician level are offered in technician institutes. The programmes lead to such areas as chemical, civil, electrical, electronics, mechanical, refrigeration and air conditioning (See note 3). Four to five year tertiary level courses at the professional level i.e. degree programmes for engineers and technologists are offered at state colleges and universities and other private institutions. The areas of study are in engineering, agriculture, fishing and technology.

III. Vocational and Technical Teacher Training

The pre-service and in-service preparation of vocational and technical teachers is shown in the diagram below.

Pre-service and in-service
Staff Development System in the Philippines



1. Pre-service Training of Vocational/Technical Teachers

The vocational/technical teachers needed by the schools can be grouped into:

- teachers of practical arts in elementary and secondary schools;

- teachers of shopwork in secondary and vocational/ technical schools;

- teachers of theory and shop practice in technician institutions and technological-based colleges and universities; and

- teachers of applied engineering sciences and physical sciences.

1.1 The profile of vocational/technical teachers presently employed in vocational/technical schools and institutions show that they are graduates of a four year Bachelors Degree in Industrial Education (BSIE) with a specialization or of a five year Bachelors Degree in Engineering. Some of those handling shop work are graduates of 3-year technician courses. Feeder schools for these types of teacher inputs are vocational trade schools and a number of private vocational schools offering courses in BSIE and the engineering schools. Technological-based chartered state colleges and univerisities are also feeders, as they offer courses in BSIE and engineering.

1.2 As there are no teacher-training institutions for training teachers for post-secondary technical programmes, not to mention technology-based degree programmes, the teacher inputs in these programmes are also BSIE graduates.

1.3 The four year teacher education curriculum leading to the degree Bachelor of Science in Industrial Education (BSIE) have options on five fields of concentration: industrial arts, home economics, art education, trade course or shop work and Physics, Math and Chemistry. The curriculum prepares teachers to teach in the elementary and secondary levels only.

Other fields of study for preparing teachers are in agricultural education, fishery education, and business education. There is a total of one hundred and five teacher training institutions offering such courses. The curriculum consist of general and liberal studies, pedagogical studies, and specialised studies.

2. In-service Training for Vocational/Technical Teachers

In-service education and training programmes are provided in many forms:

- a crash orientation course in pedagogical concepts
- an industry-based in-plant training
- institution-based training package
- in-country courses via national workshops, conference and congresses
- foreign-country based specialized training programmes.

3. Continuing Education Programmes

There are post graduate programmes on the Masteral and Doctoral levels designed for technical teachers, supervisors and heads of technical institutions. These courses prepare the teachers to be effective implementors of technical programmes in their respective institutions.

4. Some exemplar curriculum for on-going Bachelor of Science in Industrial Education (B.S.I.E.) and the proposed Bachelor of Science in Technician Education (B.S.T.E.) including sample curriculum for in-service training programmes are available at the Technological University of the Philippines (TUP).

IV Problems, - Issues, - Innovations

A. Problems/Issues

1. There appears to be some lack of co-ordination among institutions involved in vocational and technical education and training as evidenced by the:

- lack of commonly accepted taxonomy for programmes and institutions, and
- absence of a nationally acceptable standards for certification and accreditation.

2. Research and development offorts among vocational/technical institutions are minimal and the activities are not organised. This could have implications on capabilities

and resources in institutions for conducting research.

3. There is a shortage of qualified teachers particularly in shop courses considering the competitive salaries of job opportunities in industry.

4. Criteria for teacher selection and recruitment vary from institution to institution. There is no co-ordinating body which could provide mechanisms for certification of qualified and competent vocational and technical teachers.

5. As there are no established technical teacher training institutions for technical teachers in post-secondary and tertiary levels the institutions have to accept inputs, from various feeder schools, needing a variety of pre-service training programmes. (See note 4)

6. The pre-service programmes come as palliative measures and interventions of "Single dose" types and do not reflect planned programmes for staff development.

B. Innovations

1. Through a presidential letter of instruction the National Polytechnic System (N.P.S.) was established with the purpose of co-ordinating efforts in vocational technical education at all levels. (See note 5)

2. Parliamentary Bill No.534 known as the Education Act of 1980 will introduce educational reforms, one of which is to establish the Bureau of Technical and Vocational Education (B.T.V.E.) which will plan, develop, supervise and regulate post secondary technical and vocational programmes.

3. Through the initiative of professional organisations like the Federation of Accrediting Associations of the Philippines (FAAP) a team of public and private technical educators are now working on mechanism for standardisation and accreditation of technical programmes.

4. Regular participants are being sent to courses conducted at the Colombo Plan Staff College for Technician Education at Singapore, to strengthen capabilities of administrators and faculty.

5. In-country courses are being conducted which focus on

specific areas or modular courses for teacher-training, accreditation and technician teacher education.

6. There will be established centres for technical education and staff development (C.T.E.S.D.), one on national level and three on regional level. (See note 6)

7. A new curriculum for the preparation of technician teachers - Bachelor of Science in Technician Education - is being reviewed by 23 technical institutions all over the country.

8. The National Manpower and Youth Council (NMYC) is conducting in-service training programmes for vocational teachers under the Ministry of Education and Culture (MEC). These are intended to upgrade competencies in line with shop practice.

9. The NMYC will introduce the use of modular instruction adapting the Modules of Employable Skills (M.E.S.) from I.L.O. as a new concept for vocational training.

[Notes]

1. The Bureau of Secondary Education has direct supervision of all public vocational and technical schools. A fourth under the Bureau of Technical and Vocational Education will be established upon approval of the Education Bill.

2. They are known as industrial technicians where the orientation is towards emphasis of practical skills.

3. They are known as engineering technicians when the bias is on theory.

4. A project on upgrading technical institutes all over the country and the establishment of four centers for technical education staff development is under negotiation for assistance by the Asian Development Bank (A.D.B.)

5. The National Polytechnic System (N.P.S.) is a coordinative body, the components of which include: T.U.P. as the Apex, state colleges and universities offering

technical programmes and the technician institutes, and the schools of arts and trades. The system will work towards co-ordinated efforts of improving technical education.

6. This is a project of the Ministry of Education and Culture with some assistance from the ADB now under negotiation.

SINGAPORE

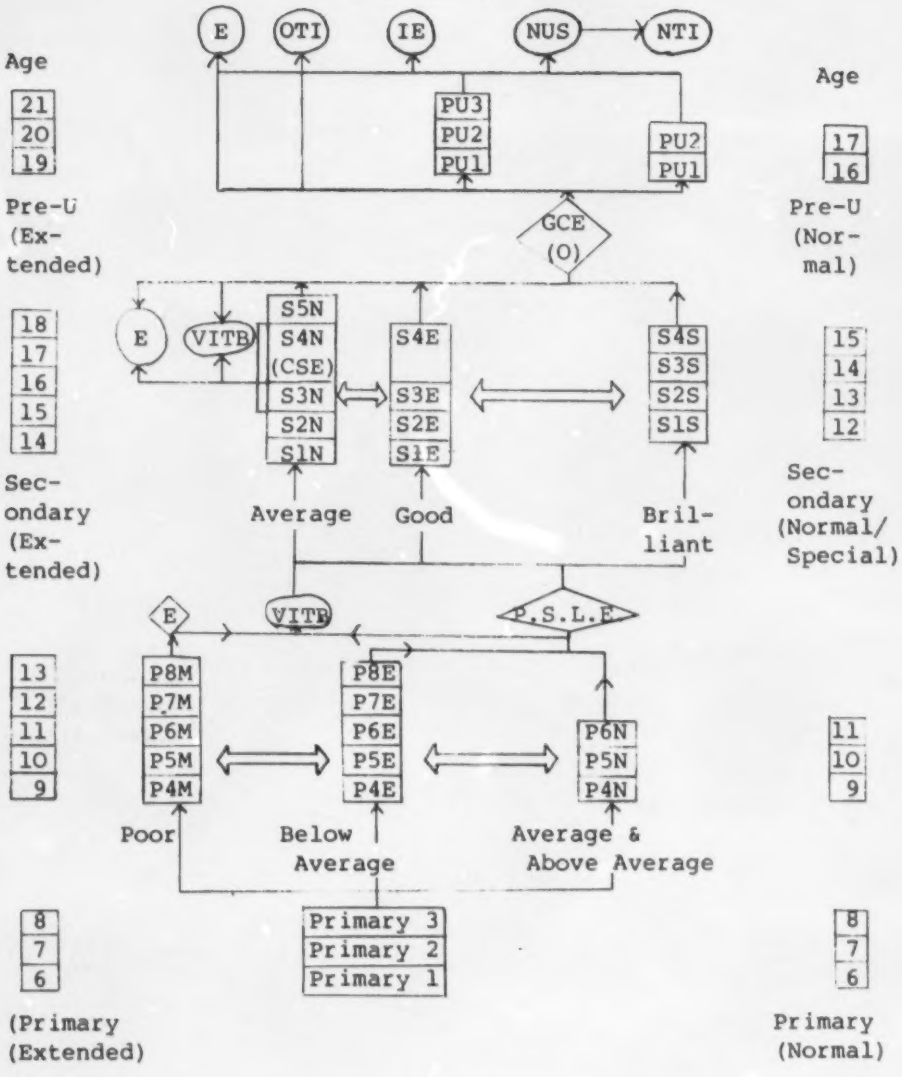
I. The Education System

1. In Singapore the Ministry of Education, headed by the Minister of Education, is both the policy-making body and the implementing agency.

2. Figure 1 depicts the New Education System which was first implemented in 1980 for the primary schools and in 1981 for the secondary schools.

3. Figure 2 shows how primary school pupils are streamed by the examination after the third year. Pupils who are less academically-inclined will then follow an extended programme and thereafter they will either seek employment or join the Vocational and Industrial Training Board (VITB) to pursue a vocational course after having completed 8 years of primary education.

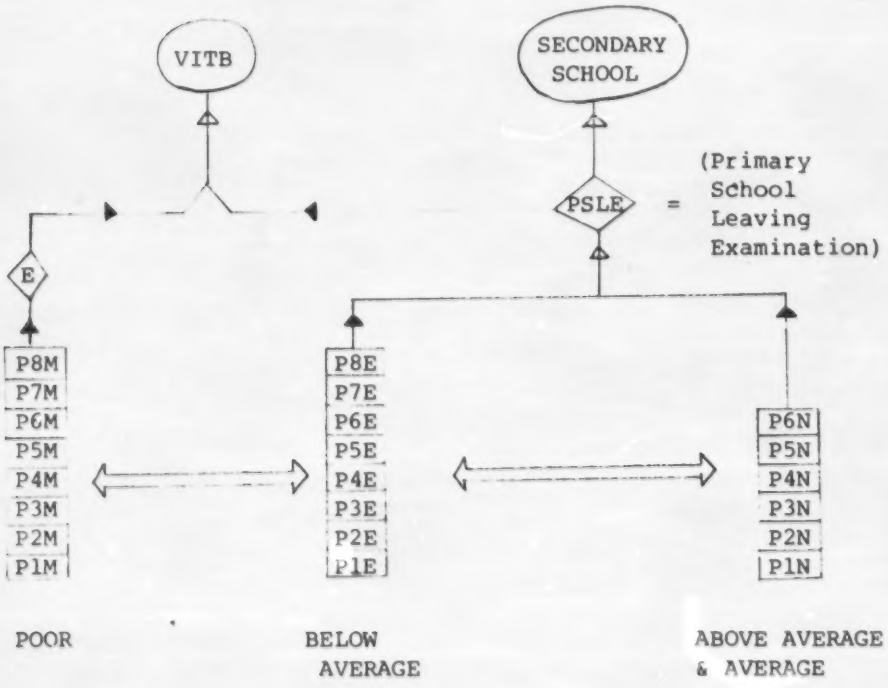
Figure 1


E
OTI
IE
NUS
NTI
Age
21
20
19
Pre-U (Extended)
PU3
PU2
PU1
PU2
PU1
Age
17
16
Pre-U (Normal)
GCE (O)
18
17
16
15
14
Secondary (Extended)
E
VITB
S5N
S4N (CSE)
S3N
S2N
S1N
S4E
S3E
S2E
S1E
S4S
S3S
S2S
S1S
15
14
13
12
Secondary (Normal/ Special)
Average
Good
Brilliant
E
VITB
P.S.L.E
13
12
11
10
9
P8M
P7M
P6M
P5M
P4M
P8E
P7E
P6E
P5E
P4E
P6N
P5N
P4N
11
10
9
Poor
Below Average
Average & Above Average
Primary 3
Primary 2
Primary 1
8
7
6
(Primary (Extended)
8
7
6
Primary (Normal)

KEY

E	- Employment
OTI	- Other Tertiary Institutions
IE	- Institute of Education
NUS	- National University of Singapore
NIT	- Nanyang Technological Institute
VITB	- Vocational and Industrial Training Board
GCE'O'	- Cambridge General Certificate of Education Ordinary Level
PSLE	- Primary School Leaving Examination
CSE	- Certificate of Secondary Education.

Figure 2



New Primary Education

1. A pupil may be retained at any level for a maximum of two years during the Primary Course.

2. At Primary 3 all pupils are streamed on the basis of the school examination results. Failures are given a re-test by the Ministry of Education to give them a second chance.

3. Pupils are channelled to one of the following:

a) Normal Primary	- 3 years)	Pupils are taught 1st and 2nd languages. They sit for common PSLE
b) Extended Primary	- 5 years)	
c) Monolingual Course	- 5 years	Pupils are taught 1st language and spoken 2nd language. At the end of course - employment or vocational course

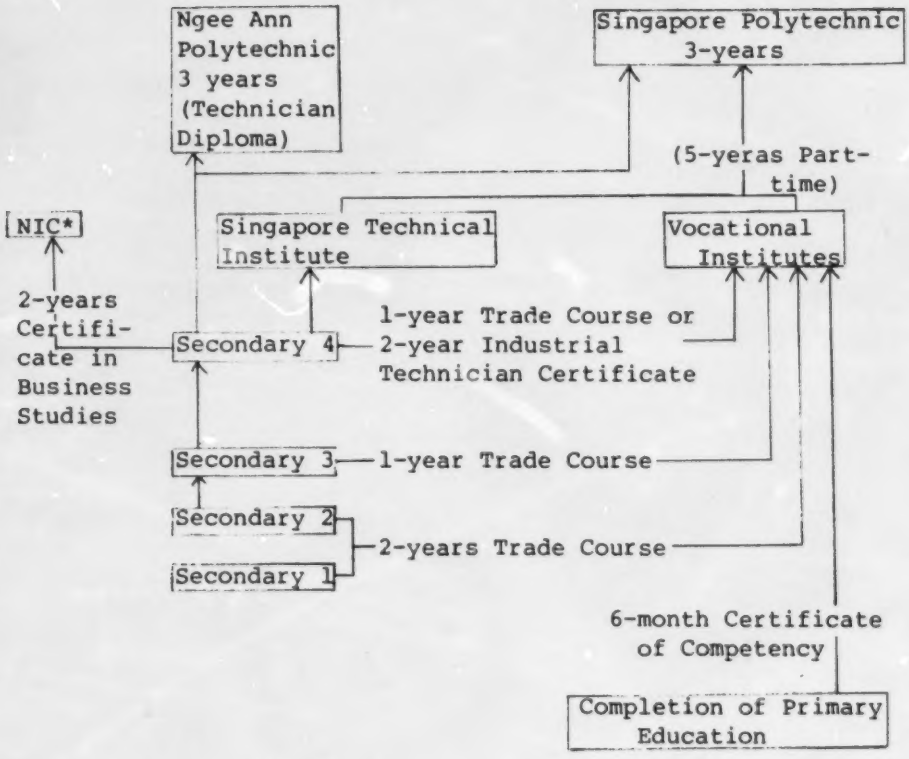
4. PSLE - Pupils must pass in 1st language and 2 other subjects to qualify for secondary education. Failures may repeat or seek employment and VITB opens to PSLE passes.

N.B. 1) Primary Education is NOT compulsory in Singapore

2) Primary Education is FREE for children of Singapore citizens

II. Vocational and Technical Education

1. Vocational and technical training for school leavers in Singapore starts at different general education levels. The vocational and technical education system can be summarised as follows:



* NIC-National Institute of Commerce

2. In Singapore the Vocational and Industrial Training Board (VITB) is the only national body responsible for vocational and industrial training. Industrial Technicians Certificates, Certificates in Business Studies, and National Trade Certificates (grades one, two and three) are awarded by the VITB to the successful candidates.

III. Vocational and Technical Teacher Training

1. The Vocational and Technical Teacher Training is conducted at the VITB Instructor Training Centre on a full time basis as well as on a part-time basis. These courses follow the same course structure as reflected in Figure 3 below.

2. Since all the trainee teachers are already on the

payroll of the Vocational and Industrial Training Board (VITB), they receive instructions along an in-service pattern.

Figure 3

TRAINING ACTIVITIES

1st Term	2nd Term	3rd Term	4th Term
3 months	3 months	3 months	3 months
3x4x5x8=480 hours	a) 3x4x2x8 =192 hours b) 3x4x3x3.6 = 129.6 hours	3x4x5x7.2 =432 hours	3x4x5x8=480 hours
In-centre full time training Each week-5 day Each day-8 hours	Day-release programme consisting of: a) In-centre full-time training for 2 days per week at 8 hours per day. b) Teaching practice at Institutions on 3 days per week at 3.6 hrs per day.	Supervised full-time teaching practice at the institutions for 7.2 hours per day-or-according to time-table loading based on a full teaching load of 36 hours per week.	In-plant attachments for trainees <u>without</u> industrial experience on full workload schedules prepared by companies.

Total training hours for those without industrial experience = 1,714 hours

Total training hours for those possessing industrial experience = 1,234 hours

3. The curriculum comprises the following subjects:-

3.1 Training Methodology

3.2 English Language and Communicative Skills

3.3 Psychology in Education

3.4 Vocational Training Systems

3.5 Audio Visual Aids

3.6 VITB Administration and Organisation

3.7 Co-curricular Activities and Trainees' Needs

IV. Problems - Innovations - Issues

A Problems

The salient problems associated with the preparation of teachers for vocational and technical education are as follows:

1. Since there has never been any form of licensing for vocational instructors, the training curriculum has never been tested. Therefore validation is requred.

2. Validation can only be effectively conducted after a reasonable time of implementation of the curriculum. Since the V.I.T.B. only commenced the training of vocational and technical teachers in July 1981 the process of validation may take a long time.

3. A cross-section of would-be vocational and technical teachers come from various educational backgrounds. Therefore there is a lack of homogeneity needed to promote a more effective delivery system of instruction.

4. Due to a large projected intake of would-be vocational and technical teachers over the next 4 to 5 years, arrangements for in-plant experience as a concluding feature of training will be a real logistics problem.

B. Innovations/Programmes

The following programmes are in the system:

1. Study tours to countries with strong vocational and technical education systems.

2. All vocational and technical teachers will undergo relevant in-service courses to keep abreast with current trends in technology.

3. Appropriate local seminars will be organized for vocational and technical teachers.

4. In the development of good work attitudes, printed materials with clear illustrations have been distributed for teachers' usage.

5. A Certificate will be issued on successful completion of the training course. Each vocational and technical teacher will be awarded two salary increments after successful completion of the training course.

SRI LANKA

I. The Education System

There are three ministries of education:

1) Ministry of Education - for schools, teacher training, colleges and curriculum development.

2) Ministry of Education Services - supplies, buildings and services for Ministry of Education.

3) Ministry of Higher Education - for universities and technical institutes.

Vocational education and teacher training are under the Ministry of Education. Technical education and technical instructor training are under the Ministry of Higher Education. The media of instruction are Sinhals, Tamil and English specially taught in all schools. Sri Lanka has essentially a state system of education with a few private schools. Education up to university level is free for full-time students.

(The School System and Curriculum)

Grade 1 - 8: 6 yrs to 13 yrs old

Grade 9 - 10: 14 yrs to 15 yrs old - general certificate of education - ordinary level.

Grade 11 - 12: 16 yrs to 17 yrs old - general certificate - advanced level.

School curriculum includes arts, science and vocational subjects.

(Higher Education)

There are seven universities and affiliated colleges, and their programmes include law, arts, science, economics, medicine, dentistry, engineering, agriculture, veterinary science and education.

II. Vocational and Technical Education

There is a need for vocational and technical education to educate and train skilled manpower for the development of agriculture, industry and energy resources and for the provision of essential services. Vocational subjects taught in schools include agriculture, animal husbandry, home science, handicraft, typing and shorthand. There are small workshops and units for doing practical work, for example, plots for cultivation in agriculture.

III. Vocational and Technical Teacher Training

Teachers are trained in vocational subjects in training colleges in addition to teaching practice and pedagogical subjects. A curriculum development centre conducts refresher courses, and their training is usually tested by examinations and by work in schools under the supervision of the school principals and education officers. After the training, new salary scales are given for satisfactory service and promotions are open to the teacher.

There are 8 polytechnical institutes for diploma level and 10 junior technical institutes (J.T.I.) for certificate level and other part-time courses in technical and commercial subjects.

The training of technical teachers is conducted at a centre in the Engineering University at Moratuwa. This training includes the trainee's subject field as well as the pedagogic subjects and teaching practice.

IV. Problems - Innovations - Issues

- the lack of equipment, particularly modern equipment and facilities.

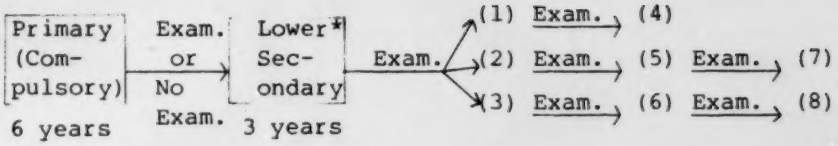
- the lack of trained and experienced teaching staff.

- the need to emphasize intermediate technology to develop alternative sources of energy, such as bio-gas, wind power, solar power and their practical application.

- the need to train sufficient personnel to suit manpower requirement.

THAILAND

I. The Education System



* General Academic with some Vocational Oriented Subjects

1. Higher Secondary General (General Academic with or without Vocational Subjects) — 3 years Certificate of High Secondary

2. Vocational Schools (DOVE)* — 3 years Certificate in Vocational Subjects

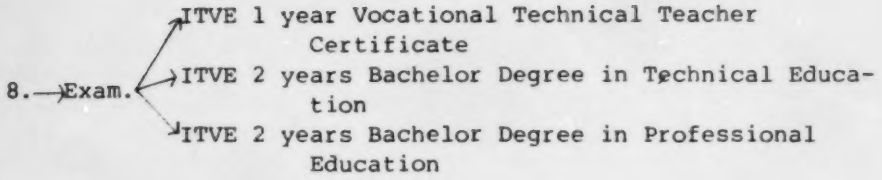
3. Technical and Vocational Institutes (ITVE)** — 3 years Certificate in Technical and Vocational Subjects

4. → Exam. → Universities 4 or 5 years Bachelor Degree
   → KMIT 4 years Bachelor Degree

5. → Exam. → Universities 4 or 5 years Bachelor Degree
   → DOVE Institutes 2 years Diploma
   → ITVE Regional Campuses 2 years Diploma
   → KMIT 4 years Bachelor Degree or 2 years Diploma

6. → Exam. → Universities 4 or 5 years Bachelor Degree
   → KMIT 4 years Bachelor Degree
   → KMIT, DOVE, ITVE 2 years Diploma

7. → Exam. → ITVE 1 year Vocational Technical Teacher Certificate
   → ITVE 2 years Bachelor Degree in Technical Education
   → ITVE 2 years Bachelor Degree in Professional Education


8.
Exam.
ITVE 1 year Vocational Technical Teacher Certificate
ITVE 2 years Bachelor Degree in Technical Education
ITVE 2 years Bachelor Degree in Professional Education

* Department of Vocational Education (DOVE)

** Institute of Technology and Vocational Education (ITVE)

*** King Mongkut Institute of Technology (KMIT)

In general, education in primary and secondary levels is the responsibility of the Ministry of Education (MOE) whereas further education is the responsibility of the Bureau of the University Affairs.

II. Vocational and Technical Education

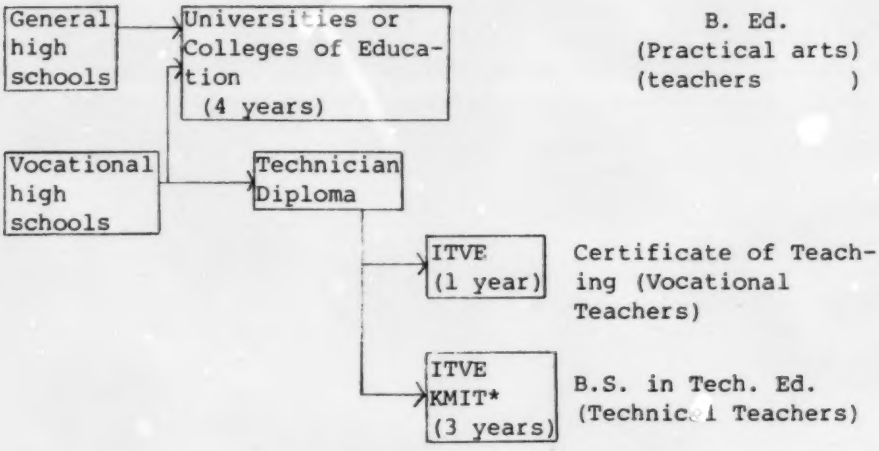
1. Introduction to the world of work is included in lower secondary education programmes, students are required to familiarized themselves with various practical arts subjects including industrial arts, agriculture, home sciences and commercial studies.

2. Successful lower secondary students may choose to enter the general comprehensive secondary high school where programmes are academically-oriented with some introduction to vocational subjects. Alternatively they may enter vocational high schools run by Department of Vocational Education or for more specialized and practical-oriented courses, attend at one of 28 campuses of the Institute of Technology and Vocational Education.

3. Achievers of the certificate of three year courses in vocational subjects are eligible to sit for the entrance examination to further their higher education in vocational and technical fields in a limited number of schools run by DOVE or in the campuses of ITVE, or in the campuses of KMIT or in the universities. The chance to acquire a place in the universities is very rare because of the stronger competition from general stream high school graduates.

4. Students who choose vocational education after they finish their lower secondary school will be able to further their education step by step from the three year vocational certificate to the two years technician diploma, and then to the two years bachelor degree when at this stage they will receive the same degree status as those who earn the bachelor degree from the universities. This passage is the sole responsibility of the ITVE, which is the only educational institution taking care of vocational and technical education up to degree level.

III. Vocational and Technical Teacher Training


General high schools
Universities or Colleges of Education (4 years)
B. Ed. (Practical arts) (teachers)
Vocational high schools
Technician Diploma
ITVE (1 year)
Certificate of Teaching (Vocational Teachers)
ITVE KMIT* (3 years)
B.S. in Tech. Ed. (Technical Teachers)
* in Engineering Technology only

1. Pre-vocational teachers training programme are offered in universities and colleges of education under MOE. These programmes are mainly for teachers who will teach at lower secondary schools.

2. Pre-service training programmes for vocational teachers are offered by ITVE. The programme are of one year duration for technician diploma holders. Succssful students will be awarded a certificate of teaching.

There are two curricula in the certificate of

teaching programme. One is an integrated programme of technology and pedagogy subjects. Another is purely pedagogical studies. Successful students of the integrated programmes will enjoy the status of being junior students of the B.S. in Tech. Ed. programme of ITVE, if they qualify by passing the entrance examination.

3. The Bachelors Degree in Technical Education programme designed for the preparation of technical teachers is offered by ITVE in every field (Engineering, Agriculture, Commerce, Home economics and Arts and Crafts) and by KMIT (in Engineering only). The programmes are two years' duration for technician diploma holders.

The curriculum structure of programme is integrated. Technological studies are provided along with pedagogical training.

Of 90 credits* total, the curriculum comprises 15 credits of general, mathematics and sciences subjects, 49 credits of technical subjects and 26 credits of pedagogical subjects. In the programme, students are required to be placed in industrial settings for the purpose of on-the-job training for at least nine weeks equivalent full-time. In addition, on the pedagogical side, students have to practise teaching under close supervision in designated vocational-technical institutes for sixteen weeks. (Six hours per week)

4. The Masters Degree in Technical Education Programme (in Engineering only) is offered by KMIT for graduates of B.S. in Tech. Ed. The programme emphasizes advanced pedagogy and research work in technical education.

5. In-service training programme for vocational and technical teachers is given through a number of short courses, seminars and workshops. In addition serving teachers are allowed study leave with full pay to further their education at advanced level. Scholarships and fellowships are also provided for both in-country and overseas training for prospective teachers.

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* One credit is 18 hours for theory and 36-54 hours for laboratory or practical subjects.

IV. Problems - Innovations - Issues

A. Problems

Main problems facing ITVE are:

1. Lack of Uniformity: Due to a severe shortage of vocational instructors in the country, some of ITVE's campuses have been obliged to start a one-year diploma course in vocational teacher training before they are ready. As a result, the instruction they provide is confined to the area of fundamentals of education whereas other more fully equipped campuses can offer a more complete training which includes professional education and additional technical subjects.

2. Shortage of Personnel: This shortage is caused by the fact that remuneration and fringe benefits to be gained from the teaching profession are rather unattractive compared to those available in industrial and commercial circles.

3. Lack of Qualified Instructors: For the same reason stated above, qualified and experienced instructors tend to seek employment elsewhere.

B. Innovations

Some planned innovations include

1. ITVE is making a long-term plan to standardize all courses in vocational teacher training in every campus.

2. Steps are being taken to upgrade instructors by providing them with fellowships and in-service training.

3. The improvement of the quality of training, through on-the-job training and closer associations with industry, trade and commerce, is proposed.

4. Efforts are being made to instil a full appreciation of professional behaviour, attitudes, and values in students training as vocational and technical teachers.

SOCIALIST REPUBLIC OF VIET NAM

I. The Education System

General education in Viet Nam compries four stages:

1. Kindergarten education (from 3 months to 6 years old)
2. General education (from 7 to 18 years old)
3. Vocational Education
4. Higher and technical secondary education

General education includes:

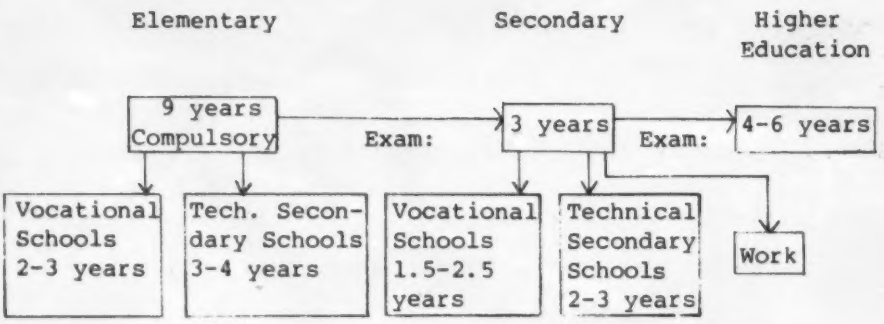
1. From grade 1 to grade 9 - Elementary general education (compulsory)
2. From grade 10 to grade 12 - secondary general education.

After finishing grade 9, and passing an examination, there are 3 ways for pupils to go:

1. General secondary schools (3 years)
2. Vocational schools (2-3 years)
3. Technical secondary schools (3-4 years)

After finishing 12 grades there are 4 ways for pupils to go:

1. Higher education (4-6 years)
2. Vocational schools (1.5-2.5 years)
3. Technical secondary schools (2-3 years)
4. Work



II. Vocational and Technical Education

Vocational and technical education has the following kinds of schools:

1. Vocational schools (2-3 years)

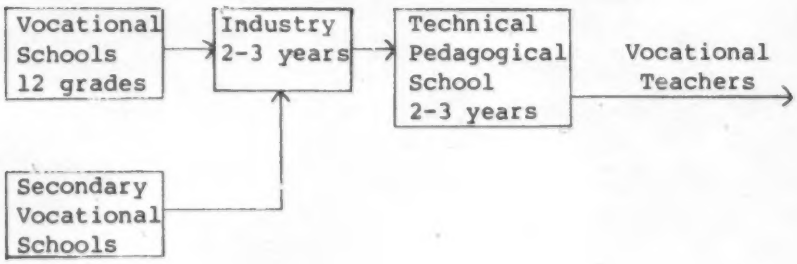
2. Vocational schools (1.5-2.5 years) for 12 grade people (for skilled works)

3. Secondary vocational schools (combines general and technical studies for 9 grade people)

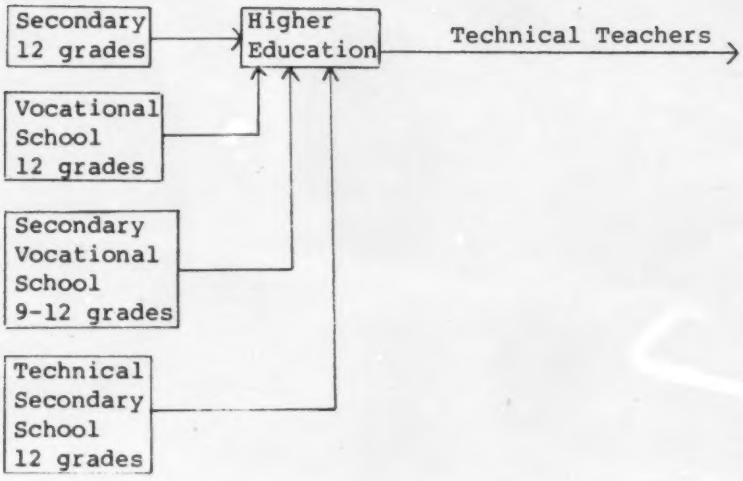
4. Vocational training centre.

III. Vocational and Technical Teacher training

1. Workshop Teachers



2. Technical Teachers



Higher education includes the following courses:

Pedagogical	Technological
Commercial	Agricultural
Constructional, etc.	

Preparing practicing teachers to attain the aim of preparing workers is obviously a complicated process which requires scientific research.

Viet Nam has to pay attention to the characteristics of developing countries: the level of production is still low, manual labour still occupies a great place, but at the same time mechanization and automation are underway in the context of scientific and technical revolutions. Therefore the main task at the moment is to define models of vocational and technical teachers in a rational way.

The best way may be to select them from skilled workers, because under the conditions of modern production, the qualifications for vocational teachers should be a combination of the following three requirements:

1. The professional skills of the workers

2. The intellect and abilities of the practicing engineers

3. The pedagogical level of the educators.

To this end, today Viet Nam is managing and building a system of technical pedagogical schools and paying attention to curriculum innovation..

IV. Trends, Issues and Problems

1. In order to define a rational model of vocational and technical teachers, it is necessary to combine the three requirements referred to above.

2. The following comprise the vocational and technical teachers:

i. Teachers of theory subjects such as science, fundamental technology, and professional technical theory. These teachers must have high level knowledge, therefore they are engineers graduated from universities.

ii. Teachers of professional practices. At present, the structure of teacher training for the teaching of professional practices is classified as follows:

- College of Technical Pedagogical Training. Students who graduate from secondary schools of general education and from vocational schools are chosen for college technical training for a thirty nonth period; and

- Technical Pedagogical Secondary Training for teachers of professional practices. They must have graduated from secondary schools of general education and vocational schools.

3. Science and technology are developing rapidly. Culture and technology are fundamental areas for the teachers to study in order that they will accept all advanced achievements. In that way they can improve their knowledge.

4. Methods of teacher training will be futher improved once our vocational schools are full developed and then can provide trained industrial workers. At the same time our national goal is to raise common cultural knowledge of workers through the education system.